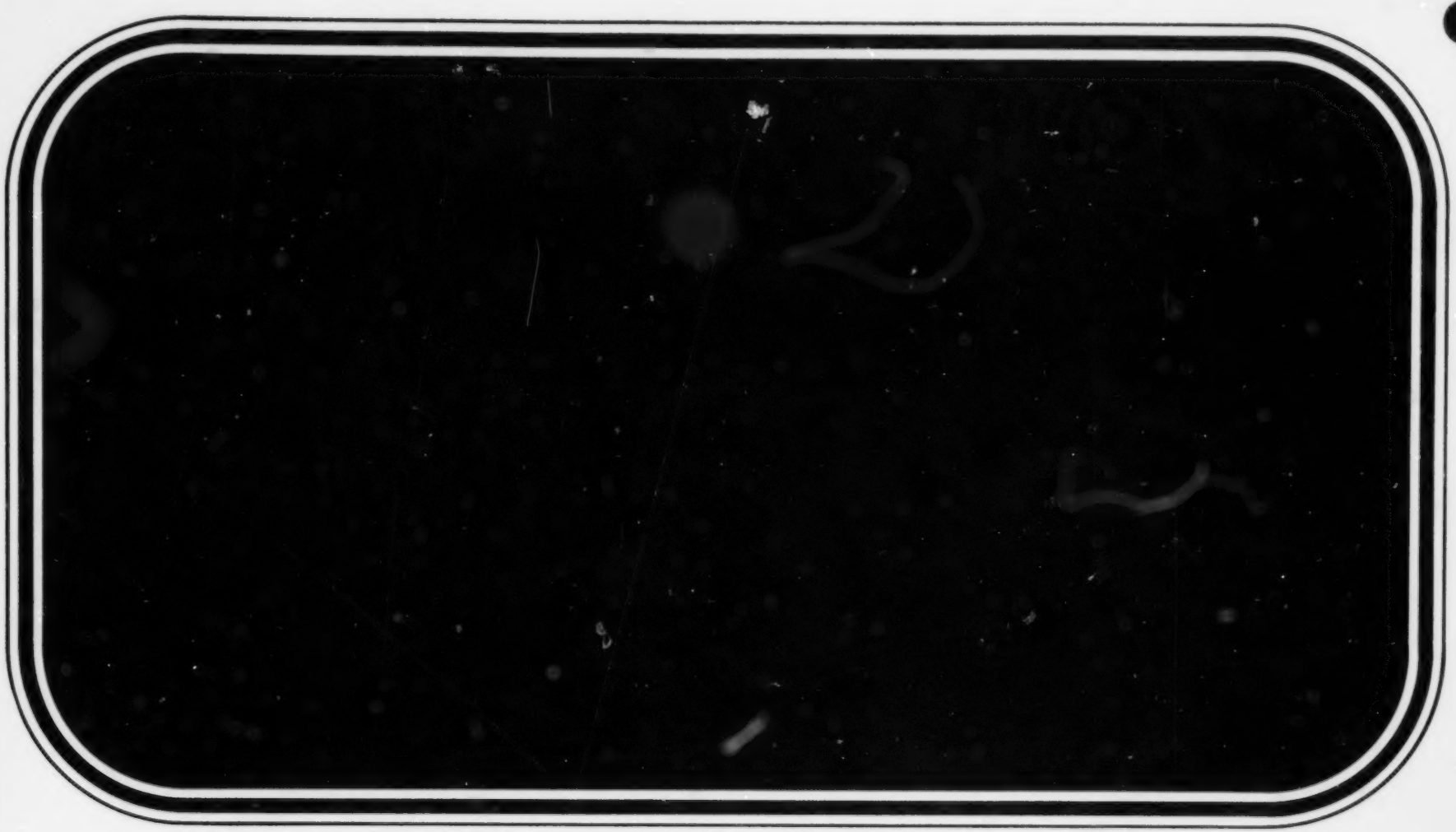

Alberta

MUNICIPAL AFFAIRS
Housing Division

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1991 ALBERTA HOUSE COST COMPARISON STUDY
EXECUTIVE SUMMARY

NOVEMBER 1991

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PREFACE

The purpose of the 1991 Alberta House Cost Comparison Study is to estimate the hard construction costs of a typical single detached house in ten urban centres across the Province and a 24 unit walk-up apartment building in Edmonton and Calgary.

The study also compares the current 1991 construction costs with those of previous years in the selected urban centres. Emphasis is given to comparing 1991 costs with 1990 costs and the study includes an analysis of the differences.

The study was carried out by the firm of Helyar & Associates and is documented in three reports:

1991 Alberta House Cost Comparison Study:	**Executive Summary**
1991 Alberta House Cost Comparison Study:	**Single Detached Dwelling**
1991 Alberta House Cost Comparison Study:	**24 Unit Walk-Up Apartment**

Additional copies of any of these reports can be ordered from :

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1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 Objectives

The objectives of the 1991 Alberta House Cost Comparison Study were:

1. To determine 1991 hard residential construction costs in ten selected urban centres in Alberta.
2. To determine reasons for differences in residential construction costs in the selected centres.
3. To carry out detailed comparisons of 1991 costs with 1990 costs in each centre.
4. To determine and comment upon residential construction cost trends over the last eleven years in each centre.

1.2 Scope of Work

The 1991 Study examined the construction costs of a typical single detached house and a 24 unit walk-up apartment building.

The study has been documented in three reports :

1991 Alberta House Cost Comparison Study:	Executive Summary
1991 Alberta House Cost Comparison Study:	Single Detached Dwelling
1991 Alberta House Cost Comparison Study:	24 Unit Walk-up Apartment

This report is the Executive Summary.

1.0 INTRODUCTION

1.2 Scope of Work (continued)

The study examined single detached dwelling construction costs in the following urban centres:

1. Calgary
2. Edmonton
3. Fort McMurray
4. Grande Prairie
5. Hinton
6. Lethbridge
7. Lloydminster
8. Medicine Hat
9. Peace River
10. Red Deer

The study for the 24 unit walk-up apartment examined construction costs in Calgary and Edmonton only.

The cost analyses examined construction cost differences between each of the centres and identified reasons for those differences with reference to such factors as:

a) material costs,

b) labour costs,

c) building features and inclusions,

d) construction specifications,

e) recent market activity and

f) other factors as appropriate.

1.2 Scope of Work (continued)

Cost estimates for the single detached dwelling for each centre include all structural, finishing, mechanical and electrical work as shown and specified on the drawings. Costs have not been included for the following items:

a) land cost and site clearance,
b) site servicing,
c) site development,
d) design fees and disbursements,
e) legal fees and disbursements,
f) marketing and real estate fees,
g) financing costs,
h) appliances (stove and refigerator), and
i) builder's overhead and profit.

Cost estimates for the 24 unit walk-up apartment for the two centres include all structural, finishing, mechanical and electrical work as shown and specified on the drawings. Costs have not been included for the following items:

a) land cost and site clearance,
b) site servicing,
c) site development,
d) design fees and disbursements,
e) legal fees and disbursements,
f) marketing and real estate fees,
g) financing costs,

1.3 Drawings

The drawings of the single detached dwelling used for this study are as follows:

a) 1 of 3: Basement/foundation plan and main/upper floor plan.
b) 2 of 3: Building elevations.
c) 3 of 3: Building sections and specifications

Reduced copies of these drawings are attached as Appendix A.

The drawings of the 24 unit walk-up apartment used for this study are as follows:

1. Site plan
2. Foundation plan
3. Basement floor plan
4. Main floor plan
5. 2nd and third floor plan
6. Building elevations
7. Section and details
8. Basement floor plan – Mechanical layout
9. Main floor plan – Mechanical layout
10. 2nd and third floor plan – Mechanical layout
11. Basement floor plan – Electrical layout
12. Main floor plan – Electrical layout
13. 2nd and third floor plan – Electrical layout

Reduced copies of these drawings are attached as Appendix B.

1.0 INTRODUCTION

1.4 Approach

Costs are provided in this report under the headings of "Labour Item Cost" and "Material/Equipment Item Cost". The breakdowns between labour and material/equipment costs have generally been provided by the applicable trade contractors. Labour rates have been determined through research and discussion with those contractors and, where necessary, realistic assessments have been made of current rates by examining the circumstances of the particular sub-trade involved. Material prices have been established by evaluation of information provided by materials suppliers and trade contractors. Discounts have been applied where appropriate.

Prior to 1988 the single detached dwelling had been a 100 square metre (1,076 sq.ft.) bungalow. In 1988 the design was updated to a four level split of 151 square metres (1,625 sq. ft.) finished on three levels and complete with an attached double garage. This year has seen a further modification to the specification and also the categories contained in the detailed costing. These revisions have been made so as to better represent current trends and estimating practices in the residential construction industry. Previous years' costs have been revised to accommodate these changes and thus enable trends from earlier studies to remain applicable.

Changes in the specification are minor and involve the upgrading of basement insulation from R8 to R12, changing internal doors to ribbon cut from rotary cut as previously specified, and changing windows to wood casement from aluminum sliders.

Prior to this year, the 24 unit walk-up apartment study had covered ten urban centres. It now covers two centres only; Calgary and Edmonton. Additionally, as with the single detached dwelling, the categories contained in the detailed costing have been revised so as to better represent estimating practices in the residential construction industry.

Cost data are assembled by sub-trade and are now presented in 15 trade categories plus a miscellaneous category for the single detached dwelling and 19 trade categories plus categories for site overhead and general contractor's overhead & profit for the 24 unit walk-up apartment. The latter two categories have now been shown with items individually costed. The sub-trade operations are combined within each trade category in order to reflect industry estimating practice.

1.4 Approach (continued)

Substitution of the Miscellaneous category for On-site Overhead for the single detached has meant that the items now included (i.e. Garbage Removal, Cleaning and Permits) more closely reflect the on-site costs associated with residential construction. The previous On-site Overhead allowance included items which are more correctly included in general contractor's overhead and profit.

The cost effects of market forces and residential construction industry conditions are addressed in Section 1.6 "Findings".

1.5 Federal Taxation

Federal Sales Tax (FST) was replaced by the Goods & Services Tax (GST) on January 1, 1991.

Prior to its demise on December 31, 1990, FST had been levied on materials at rates of 9% and 13.5%. The allocation of the differing rates was defined in the relevant rules and regulations but, as an example, the higher rate was applied to items such as carpet, mechanical equipment and lighting fixtures. There were exceptions to the above, some items were exempt and the odd one or two had different rates of tax applied.

GST however, with a few exceptions, has a rate of 7% applied to all goods and services.

The Federal Government has instituted a system of rebates for residential construction for both FST and GST. The rebate applicable to FST, the Federal Sales Tax New Housing Rebate, was in effect throughout 1991. This rebate was applied to the purchase price of the house at the rate of 4.25% (or alternatively a rate of $50 per square metre of habitable area could be utilized). To qualify certain criteria must have been met:

1. The construction or substantial renovation of the house must have started before January 1, 1991, which meant that the footings for the house must have been in place on January 1, 1991.
2. The house must not have been occupied as a residence between the commencement of construction or substantial renovation and January 1, 1991.
3. The house must have been substantially completed, meaning at least 90% complete, before December 31, 1991.
4. Possession of the house must have been transferred after December 31, 1990 and before December 31, 1991.
5. GST must have been payable on the transaction.

1.5 Federal Taxation (continued)

The amount of FST rebate would have been 2/3 of the Estimated FST (calculated as above) if possession was taken before April 1, 1991 and would have been 1/3 of the Estimated FST if possession was taken between April 2, 1991 and December 31, 1991. No adjustment has been made in this study for the FST rebate.

The GST rebate is calculated as follows:

7% GST is paid on the full sale price of the house. Where the price of the house is less than $350,000 the purchaser will receive a GST Rebate equal to 36% of the GST payable or $8,750, whichever is less. This GST Rebate may also be assigned to the vendor at the time of sale to decrease the purchase price accordingly. The amount of the GST Rebate is decreased for houses in the $350,000 to $450,000 price range and there is no GST Rebate for any portion of the purchase price if the house price is greater than $450,000.

This rebate is an ongoing reduction and is therefore applicable after 1991.

In order to compare 1991 prices with those of previous years on an equitable basis, the single detached dwelling GST has been added to the cost of the dwellings at the rate of 4.48%. This represents the standard GST rate of 7% less the rebate amount of 36% as defined previously.

Although the Federal Sales Tax New Housing Rebate is not applicable to the dwelling in this study, it can be seen that, when applied, it was at a rate of 4.25%. It could, therefore, be reasonably argued that the impact of GST is an addition of 0.23% on the full cost of a dwelling. (i.e. 4.48% – 4.25%)

1.6 Findings

Economic Factors

Canada's economy experienced the full effect of recession in 1991 and although Ontario and Quebec were probably hardest hit, Alberta did not get by unscathed. The problem of the provincial debt, debt financing and annual budget deficits meant that the cuts in government spending, particularly on capital construction projects, were continued through the 1991 budget and little change is expected through 1992.

1.6 Findings (continued)

Economic Factors (continued)

Despite interest rates which fell significantly through 1991, in November the Canadian dollar reached it's strongest level againt the US dollar since 1978 which meant that national and provincial exports were less competitive in world markets.

The latter part of 1990 and early 1991 saw a weakening of domestic demand; housing starts fell and retail sales declined. The introduction of the GST in January 1991 and the effects of the Free Trade Agreement with the United States (e.g. cross border shopping) added to this decline. All of these factors have led to a higher unemployment rate.

In addition to the introduction of the GST, the Federal Government cut transfers to the provinces which fund health, education and social assistance programs. These measures, among others, were taken to reduce the national debt but in many respects merely passed on fiscal problems to the provinces. The political instability caused by the government's inability to resolve the national unity issue continues to create uncertainty in the minds of foreign investors.

Oil prices have remained relatively weak, certainly less than was predicted in the 1991 provincial budget and therefore royalty revenues have been lower than anticipated. Several major companies involved in the oil sector have continued to reduce staff levels, the effects of which have been most strongly felt in Calgary.

The very modest growth in Gross Domestic Product in the province of just under one percent was sustained to a large extent by projects such as the Lloydminster heavy oil upgrader, the Caroline sour gas plant and the Alberta Pacific (Al Pac) forestry project. While these projects will continue through 1992, they are not sufficient to sustain continued growth.

All of these factors have contributed to a weakening of both consumer and investor confidence.

On the positive side, a lower bank rate has seen conventional mortgage interest rates fall to their lowest level in many years. This has, to a degree, stimulated new house construction but not to the extent that a significant turnaround could be predicted.

1.6 Findings (continued)

Labour

The construction of residential units is generally undertaken by a home builder acting in the capacity of a project manager who employs sub–trades to undertake the work. The construction of apartment buildings is generally undertaken by a developer/builder hiring or acting in the capacity of a project manager who employs sub–trades to undertake the work. These sub–trades generally use non–union labour whose rates of pay are determined by market forces.

With the exception of Calgary and Peace River where significant decreases in labour rates have occurred, the other centres have remained relatively stable throughout 1991. Calgary's overall housing starts for 1989 and 1990 were 6000 and 7006 respectively and in 1991 they were 4744, a substantial reduction. This has meant that a market which supported a fairly large number of sub–trades has shrunk considerably creating an extremely competitive environment and consequently lower prices. Again in Peace River, although the numbers are not comparable to Calgary, a tremendous drop off in housing starts has increased competition and reduced rates.

Materials

Material prices for the single detached dwelling have dropped dramatically in all centres, Fort McMurray experiencing the least decrease at 7.4% and Calgary the highest at 12.8%, the average being 9.94%. For the 24 unit walk–up apartment building, Edmonton experienced the least decrease at 7.1% and Calgary the highest at 10.3%. While the reduction has been experienced "across the board" there have been major drops in the prices of lumber, floor coverings (carpet and vinyl) and drywall. Lumber prices, it should be noted, vary considerably throughout the year and are generally at their highest in late spring/early summer, however 1991 saw prices significantly lower than in 1990.

The general decrease that has been experienced can be attributed to the economy. Lack of demand for materials in the major markets of Quebec and Ontario has increased competition for business country wide. This coupled with a decline in housing starts in Alberta of almost 30% compared to 1990 has meant that suppliers have had to reduce prices to remain competitive. Sub–trades have also had to cut their profit margins and this has been reflected in lower prices. The comments regarding labour that were made relative to Calgary and Peace River are equally applicable to materials.

1.6 Findings (continued)

Apartment Construction

Following the downturn in 1981–82, construction of apartment buildings across Alberta was virtually non–existent. Only in recent years has activity recommenced in Calgary and Edmonton. Edmonton, in particular, has shown an impressive increase in new starts made up of semi, row and apartment style building construction in both 1990 and 1991. The recent trends indicate many of the new starts for these types of buildings are for purchase as well as rental properties. Calgary, on the other hand, has experienced significant decreases from 1990 and 1989.

Highlights by Centre

Calgary	S.D.Dwelling	Apartment
Total cost of construction	$71,946	$761,274
Cost per square foot	$44.27	$38.09
Change from 1990	-11.0%	-8.5%
Difference in labour cost	-7.1%	-5.4%
Difference in material/equipment cost	-8.8%	-10.3%

Calgary's single detached housing starts for 1991 were down by 25% compared to 1990. The total of 4149 still remained the highest in the province but most of the production was, as in previous years, aimed at the high end of the market.

Semi–detached, row and apartment starts were also down significantly, showing a drop of almost 59%, which contributed to a major downturn in the overall new housing market. The downturn has generated lower labour and material rates as competition has become more emulous. Sub–trades are, in fact, competing for work in Red Deer and Edmonton.

1.6 Findings (continued)

Highlights by Centre (continued)

Edmonton	S.D.Dwelling	Apartment
Total cost of construction	$73,281	$783,830
Cost per square foot	$45.10	$39.21
Change from 1990	-5.6%	-4.9%
Difference in labour cost	1.4%	-1.1%
Difference in material/equipment cost	-8.8%	-7.1%

While single detached housing starts in Edmonton for 1991 were down by 37% compared to 1990, semi-detached, row and apartment starts were up by over 12%. The overall effect on new house construction has, therefore, been a reduction of 27% which is less than the drop experienced in Calgary. The overall effect on new multi-unit construction has been a total cost decrease of 4.9%.

Fort McMurray

Total cost of construction	$81,831
Cost per square foot	$50.36
Change from 1990	- 5.6%
Difference in labour cost	- 1.7%
Difference in material/equipment cost	- 7.4%

Fort McMurray is still the most expensive centre, of the ten studied. The 5.6% decrease in price is comparable to other centres but might have been greater had the 32 new starts not been primarily in the Saprae Creek area where houses are selling in the $300,000 range. The cost information obtained may have been influenced by the higher specification for these dwellings.

1.6 Findings (continued)

Highlights by Centre (continued)

Grande Prairie

Total cost of construction	$76,081
Cost per square foot	$46.82
Change from 1990	- 8.8%
Difference in labour cost	- 2.1%
Difference in material/equipment cost	-11.8%

Single family starts in Grande Prairie have declined, but by only 14%, the least of any of the centres, with the exception of Hinton and Lloydminster where there were increases. Housing activity remains reasonably stable.

Hinton

Total cost of construction	$78,706
Cost per square foot	$48.43
Change from 1990	- 5.3%
Difference in labour cost	- 0.6%
Difference in material/equipment cost	- 7.6%

Although Hinton has seen a steady rise in housing starts over the last four years, 7 in 1988, 10 in 1989, 24 in 1990 and 40 in 1991, the effect of the general recession in industry throughout the province has meant that prices in the town have not risen as one might have expected.

1.6 Findings (continued)

Highlights by Centre (continued)

Lethbridge

Total cost of construction	$74,580
Cost per square foot	$45.90
Change from 1990	- 6.3%
Difference in labour cost	- 2.2%
Difference in material/equipment cost	- 8.1%

Housing starts in Lethbridge were down substantially from 1990 showing an overall drop of 64%. Single family starts were down 46%, to a level somewhat lower than 1988. This decline in activity contributed to the competitive pricing in the home construction market.

Lloydminster

Total cost of construction	$71,201
Cost per square foot	$43.82
Change from 1990	- 8.4%
Difference in labour cost	0.0%
Difference in material/equipment cost	-11.8%

Single family housing starts in Lloydminster showed an increase for the third consecutive year with 74 homes being started, compared to 45 in 1990 and 28 in 1989. Most of the activity occurred in Alberta, but companies vying for work came from both sides of the provincial border and consequently prices remained competitive.

1.6 Findings (continued)

Highlights by Centre (continued)

Medicine Hat

Total cost of construction	$73,529
Cost per square foot	$45.25
Change from 1990	- 7.5%
Difference in labour cost	- 0.8%
Difference in material/equipment cost	-10.4%

Although housing starts were up by 10% in Medicine Hat it was primarily due to an increase of 65 apartment units, 83 being constructed in 1991 compared to 18 in 1990. Single family starts were down 19% to 164 units, the lowest number since 1988. Costs in Medicine Hat remain similar to those in Lethbridge, the other major centre in the southern part of the province which the study reviewed.

Peace River

Total cost of construction	$77,210
Cost per square foot	$47.51
Change from 1990	- 9.9%
Difference in labour cost	- 4.5%
Difference in material/equipment cost	-12.3%

Peace River experienced a very small increase in population in 1991 having acquired a further 52 inhabitants. Single family starts were down dramatically to 10 in 1991, from 23 in 1990, and a high of 113 in 1989 following the construction of the Daishowa pulp mill. While costs remain high because of the remoteness of the town, fierce competition is being experienced from other centres and consequently prices have shown a marked reduction.

1.6 Findings (continued)

Highlights by Centre (continued)

Red Deer

Total cost of construction	$74,820
Cost per square foot	$46.04
Change from 1990	- 5.0%
Difference in labour cost	2.6%
Difference in material/equipment cost	- 8.4%

The overall decrease in cost in Red Deer is the lowest of any of the centres studied, which is interesting as it experienced the the lowest increase in 1990. Single family starts were down 15% and overall housing starts were down by 16%, even though the city experienced an increase in population of 1,330. Competition for work in Red Deer by trades from other centres contributes to lower prices.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 1 : Total Building Costs

ITEM	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
Labour	$24,200 33.6%	$24,884 34.0%	$26,746 32.7%	$25,351 33.3%	$26,954 34.2%	$23,882 32.0%	$22,759 32.0%	$24,106 32.8%	$25,557 33.1%	$25,232 33.7%
Material	$47,746 66.4%	$48,397 66.0%	$55,085 67.3%	$50,730 66.7%	$51,752 65.8%	$50,698 68.0%	$48,442 68.0%	$49,423 67.2%	$51,653 66.9%	$49,588 66.3%
Total 1991	$71,946	$73,281	$81,831	$76,081	$78,706	$74,580	$71,201	$73,529	$77,210	$74,820
Cost / m2	$476.46	$485.30	$541.93	$503.85	$521.23	$493.91	$471.53	$486.95	$511.32	$495.50
Cost / SF	$44.27	$45.10	$50.36	$46.82	$48.43	$45.90	$43.82	$45.25	$47.51	$46.04
Cost / SF 1990	$49.74	$47.76	$53.35	$51.35	$51.16	$48.96	$47.83	$48.91	$52.72	$48.46
Total 1990	$80,825	$77,618	$86,697	$83,444	$83,128	$79,565	$77,717	$79,472	$85,676	$78,751
% Change From 1990	-11.0%	-5.6%	-5.6%	-8.8%	-5.3%	-6.3%	-8.4%	-7.5%	-9.9%	-5.0%

For comparison purposes, 1990 and previous years costs were adjusted to reflect the 1991 substitution of "Miscellaneous Costs" for "Site Overheads". On average, the adjustments result in a 5.7% reduction .

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 2 : Comparative Cost Ratios

LOCATION	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
CALGARY	1.00	1.02	1.14	1.06	1.09	1.04	0.99	1.02	1.07	1.04
EDMONTON	0.98	1.00	1.12	1.04	1.07	1.02	0.97	1.00	1.05	1.02
FORT McMURRAY	0.88	0.90	1.00	0.93	0.96	0.91	0.87	0.90	0.94	0.91
GRANDE PRAIRIE	0.95	0.96	1.08	1.00	1.03	0.98	0.94	0.97	1.01	0.98
HINTON	0.91	0.93	1.04	0.97	1.00	0.95	0.90	0.93	0.98	0.95
LETHBRIDGE	0.96	0.98	1.10	1.02	1.06	1.00	0.95	0.99	1.04	1.00
LLOYD-MINSTER	1.01	1.03	1.15	1.07	1.11	1.05	1.00	1.03	1.08	1.05
MEDICINE HAT	0.98	1.00	1.11	1.03	1.07	1.01	0.97	1.00	1.05	1.02
PEACE RIVER	0.93	0.95	1.06	0.99	1.02	0.97	0.92	0.95	1.00	0.97
RED DEER	0.96	0.98	1.09	1.02	1.05	1.00	0.95	0.98	1.03	1.00

Note : The ratios represent the cost for a city in the top row of the table divided by the cost for a city listed in the left hand column. For example, Red Deer costs are 1.02 times Edmonton costs.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 3 : Comparative Costs 1990 - 1991

LOCATION	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
Labour Cost										
1991	$24,200	$24,884	$26,746	$25,351	$26,954	$23,882	$22,759	$24,106	$25,557	$25,232
1990	$26,049	$24,544	$27,198	$25,901	$27,122	$24,416	$22,765	$24,289	$26,748	$24,595
Difference	($1,849)	$340	($452)	($550)	($168)	($534)	($6)	($183)	($1,191)	$637
% Difference	-7.1%	1.4%	-1.7%	-2.1%	-0.6%	-2.2%	0.0%	-0.8%	-4.5%	2.6%
Material Cost										
1991	$47,746	$48,397	$55,085	$50,730	$51,752	$50,698	$48,442	$49,423	$51,653	$49,588
1990	$54,776	$53,074	$59,499	$57,543	$56,006	$55,149	$54,952	$55,183	$58,928	$54,156
Difference	($7,030)	($4,677)	($4,414)	($6,813)	($4,254)	($4,451)	($6,510)	($5,760)	($7,275)	($4,568)
% Difference	-12.8%	-8.8%	-7.4%	-11.8%	-7.6%	-8.1%	-11.8%	-10.4%	-12.3%	-8.4%
Total Cost										
1991	$71,946	$73,281	$81,831	$76,081	$78,706	$74,580	$71,201	$73,529	$77,210	$74,820
1990	$80,825	$77,618	$86,697	$83,444	$83,128	$79,565	$77,717	$79,472	$85,676	$78,751
Difference	($8,879)	($4,337)	($4,866)	($7,363)	($4,422)	($4,985)	($6,516)	($5,943)	($8,466)	($3,931)
% Difference	-11.0%	-5.6%	-5.6%	-8.8%	-5.3%	-6.3%	-8.4%	-7.5%	-9.9%	-5.0%

2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD. 4:

COMPARATIVE COSTS BAR CHART 1990 - 1991

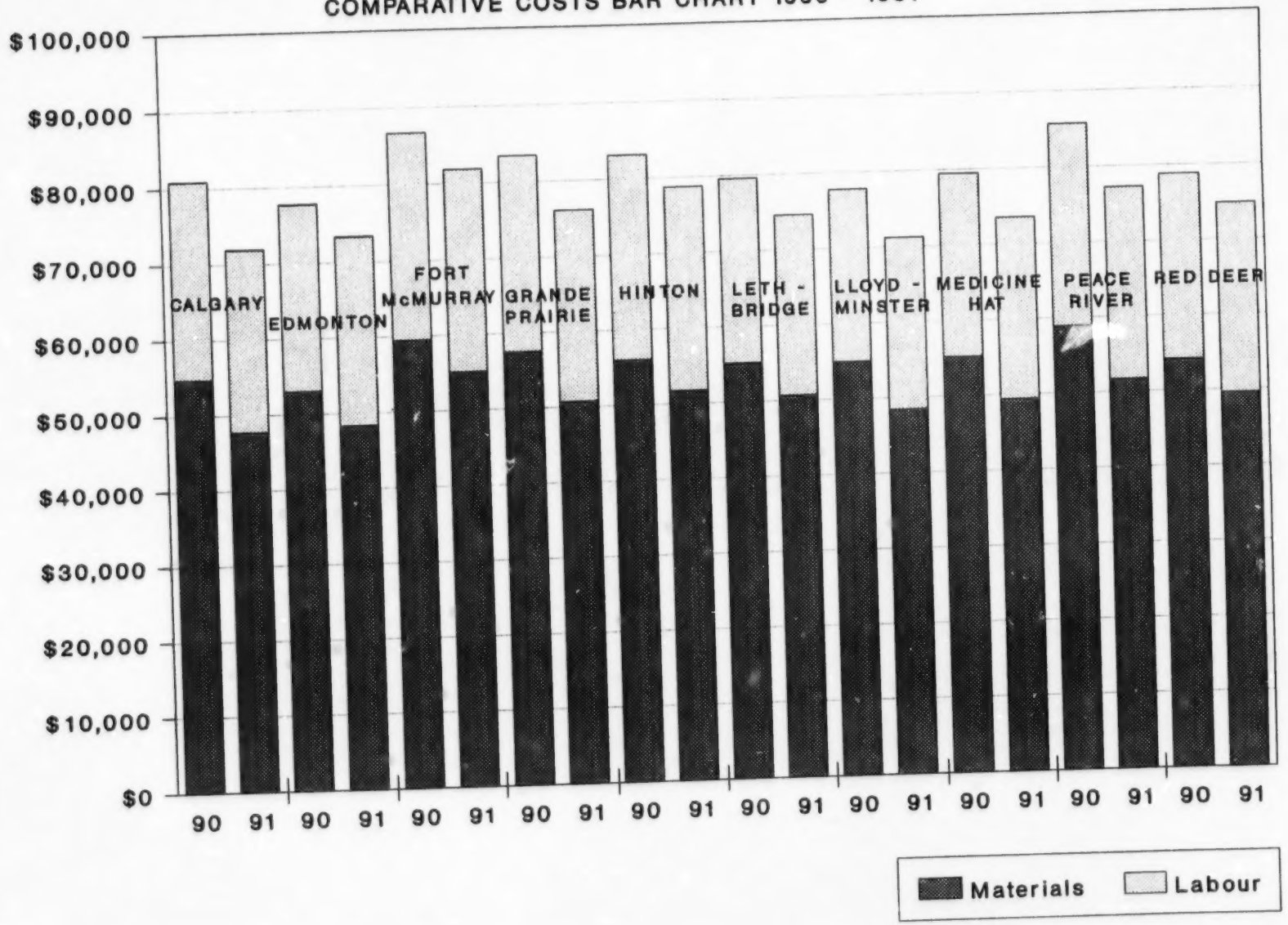


TABLE SD. 5 : Comparative Total Building Costs 1981 – 1991 (Nominal Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
1981	$63,833	$59,726	$60,246	$72,948	$67,376	–	$63,235	–	$62,715	–	$60,587
1982	$61,891	$55,665	$56,933	$69,797	$61,432	$64,063	$62,699	–	$63,527	–	$61,009
1983	$58,195	$52,742	$53,911	$64,924	$61,042	$59,872	$57,988	–	$59,336	–	$55,746
1984	$60,019	$53,635	$53,992	$68,124	$64,307	$62,536	$58,475	$63,934	$60,002	–	$55,162
1985	$61,155	$56,348	$56,234	$68,757	$64,566	$62,861	$59,580	$64,501	$59,645	–	$57,907
1986	$63,563	$58,280	$58,540	$72,088	$67,832	$66,207	$61,513	$65,720	$61,789	–	$60,100
1987	$70,389	$70,336	$63,578	$79,316	$73,416	$71,546	$67,440	$70,643	$68,037	–	$69,187
1988	$73,530	$72,470	$67,581	$80,284	$76,430	$74,065	$71,697	$72,046	$71,887	$77,401	$71,436
1989	$77,251	$76,456	$72,217	$82,886	$79,715	$77,968	$75,748	$74,471	$76,332	$80,511	$76,204
1990	$81,289	$80,825	$77,618	$86,697	$83,444	$83,128	$79,565	$77,717	$79,472	$85,676	$78,751
1991	$75,319	$71,946	$73,281	$81,831	$76,081	$78,706	$74,580	$71,201	$73,529	$77,210	$74,820

Notes :
1. Hinton was not included in the 1981 study.
2. Lloydminster was not included in the 1981 through 1983 studies.
3. Peace River was not included in the 1981 through 1987 studies.
4. Costs for years prior to 1988 have been adjusted to apply to the split-level model used in the 1988 study instead of the bungalow used in previous years.
5. Costs for years prior to 1991 have been adjusted to incorporate the current revised detailed costing format.

TABLE SD. 6 : Comparative Total Building Costs 1981 – 1991 (Inflation Adjusted Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
1981	$102,580	$95,980	$96,815	$117,227	$108,273	–	$101,619	–	$100,783	–	$97,363
1982	$89,741	$80,714	$82,553	$101,206	$89,076	$92,891	$90,914	–	$92,114	–	$88,463
1983	$79,727	$72,257	$73,858	$88,946	$83,628	$82,025	$79,444	–	$81,290	–	$76,372
1984	$80,065	$71,549	$72,025	$90,877	$85,786	$83,423	$78,006	$85,288	$80,043	–	$73,586
1985	$79,135	$72,914	$72,767	$88,972	$83,548	$81,342	$77,097	$83,464	$77,181	–	$74,932
1986	$79,645	$73,025	$73,351	$90,326	$84,993	$82,957	$77,076	$82,347	$77,422	–	$75,305
1987	$84,607	$84,544	$76,421	$95,338	$88,246	$85,998	$81,063	$84,913	$81,780	–	$83,163
1988	$86,030	$84,790	$79,070	$93,932	$89,423	$86,656	$83,885	$84,294	$84,108	$90,559	$83,580
1989	$86,521	$85,631	$80,883	$92,832	$89,281	$87,324	$84,838	$83,408	$85,492	$90,172	$85,348
1990	$86,085	$85,594	$82,197	$91,812	$88,367	$88,033	$84,259	$82,302	$84,161	$90,731	$83,397
1991	$75,319	$71,946	$73,281	$81,831	$76,081	$78,706	$74,580	$71,201	$73,529	$77,210	$74,820

Notes :
1. Hinton was not included in the 1981 study.
2. Lloydminster was not included in the 1981 through 1983 studies.
3. Peace River was not included in the 1981 through 1967 studies.
4. Costs for years prior to 1988 have been adjusted to apply to the split-level model used in the 1988 study instead of the bungalow used in previous years.
5. Costs for years prior to 1991 have been adjusted to incorporate the current revised detailed costing format.

TABLE SD. 7 : Comparative Square Foot Unit Costs 1981 – 1991 (Nominal Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
1981	$39.28	$36.75	$37.07	$44.89	$41.46	–	$38.91	–	$38.59	–	$37.28
1982	$38.09	$34.26	$35.04	$42.95	$37.80	$39.42	$38.58	–	$39.09	–	$37.54
1983	$35.81	$32.46	$33.18	$39.95	$37.56	$36.84	$35.68	–	$36.51	–	$34.31
1984	$36.93	$33.01	$33.23	$41.92	$39.57	$38.48	$35.98	$39.34	$36.92	–	$33.95
1985	$37.63	$34.68	$34.61	$42.31	$39.73	$38.68	$36.66	$39.69	$36.70	–	$35.64
1986	$39.12	$35.86	$36.02	$44.36	$41.74	$40.74	$37.85	$40.44	$38.02	–	$36.98
1987	$43.32	$43.28	$39.12	$48.81	$45.18	$44.03	$41.50	$43.47	$41.87	–	$42.58
1988	$45.25	$44.60	$41.59	$49.41	$47.03	$45.58	$44.12	$44.34	$44.24	$47.63	$43.96
1989	$47.54	$47.05	$44.44	$51.01	$49.06	$47.98	$46.61	$45.83	$46.97	$49.55	$46.89
1990	$50.02	$49.74	$47.76	$53.35	$51.35	$51.16	$48.96	$47.83	$48.91	$52.72	$48.46
1991	$46.35	$44.27	$45.10	$50.36	$46.82	$48.43	$45.90	$43.82	$45.25	$47.51	$46.04

Notes :
1. Hinton was not included in the 1981 study.
2. Lloydminster was not included in the 1981 through 1983 studies.
3. Peace River was not included in the 1981 through 1987 studies.
4. Costs for years prior to 1988 have been adjusted to apply to the split-level model used in the 1988 study instead of the bungalow used in previous years.
5. Costs for years prior to 1991 have been adjusted to incorporate the current revised detailed costing format.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

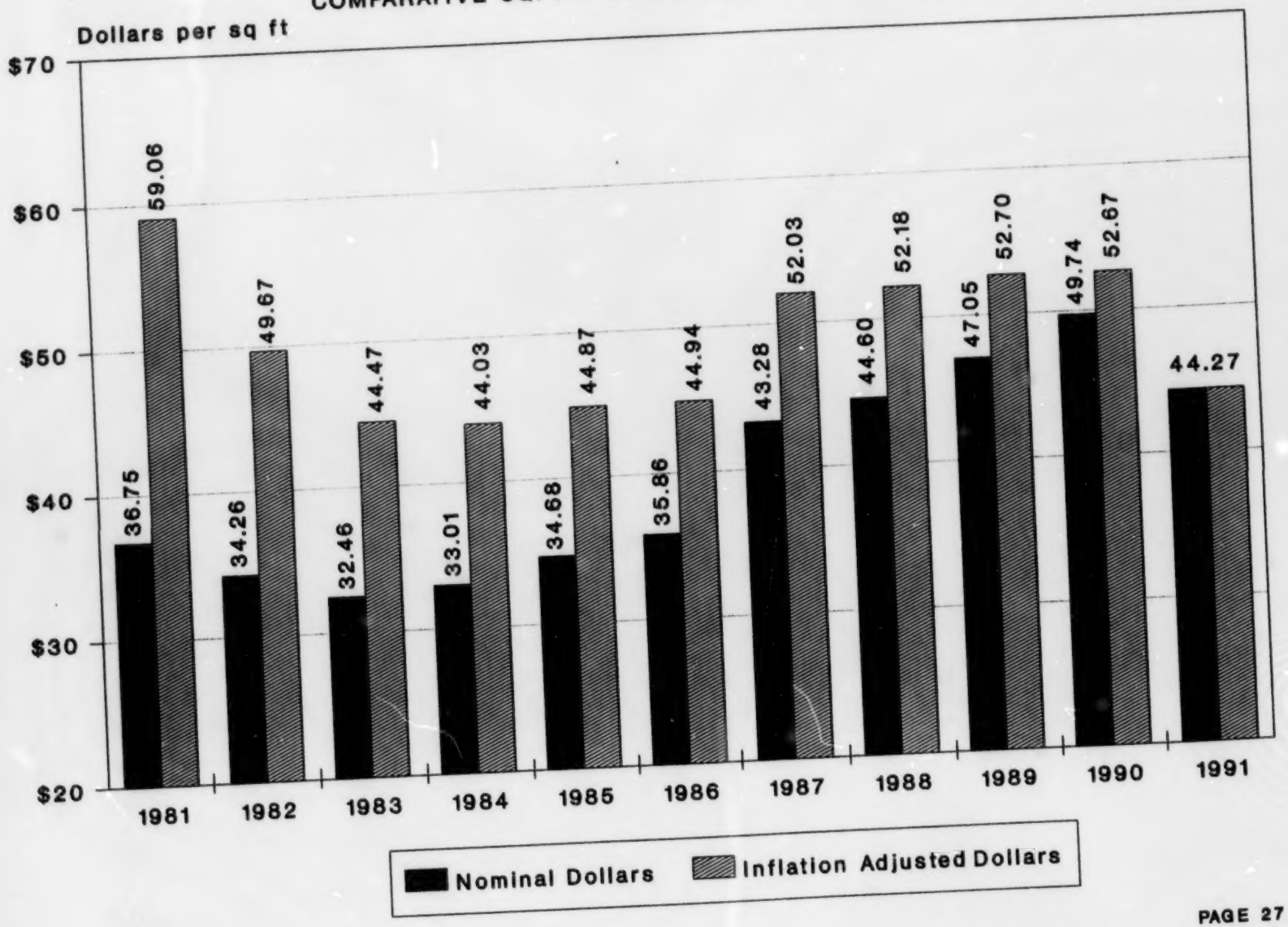
TABLE SD. 8 : Comparative Square Foot Unit Costs 1981 – 1991 (Inflation Adjusted Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
1981	$63.13	$59.06	$59.58	$72.14	$66.63	–	$62.53	–	$62.02	–	$59.92
1982	$55.23	$49.67	$50.80	$62.28	$54.82	$57.16	$55.95	–	$56.69	–	$54.44
1983	$49.06	$44.47	$45.45	$54.74	$51.46	$50.48	$48.89	–	$50.02	–	$47.00
1984	$49.27	$44.03	$44.32	$55.92	$52.79	$51.34	$48.00	$52.48	$49.26	–	$45.28
1985	$48.70	$44.87	$44.78	$54.75	$51.41	$50.06	$47.44	$51.36	$47.50	–	$46.11
1986	$49.01	$44.94	$45.14	$55.59	$52.30	$51.05	$47.43	$50.68	$47.64	–	$46.34
1987	$52.07	$52.03	$47.03	$58.67	$54.31	$52.92	$49.88	$52.25	$50.33	–	$51.18
1988	$52.94	$52.18	$48.66	$57.80	$55.03	$53.33	$51.62	$51.87	$51.76	$55.73	$51.43
1989	$53.24	$52.70	$49.77	$57.13	$54.94	$53.74	$52.21	$51.33	$52.61	$55.49	$52.52
1990	$52.98	$52.67	$50.58	$56.50	$54.38	$54.17	$51.85	$50.65	$51.79	$55.83	$51.32
1991	$46.35	$44.27	$45.10	$50.36	$46.82	$48.43	$45.90	$43.82	$45.25	$47.51	$46.04

Notes :
1. Hinton was not included in the 1981 study.
2. Lloydminster was not included in the 1981 through 1983 studies.
3. Peace River was not included in the 1981 through 1987 studies.
4. Costs for years prior to 1988 have been adjusted to apply to the split-level model used in the 1988 study instead of the bungalow used in previous years.
5. Costs for years prior to 1991 have been adjusted to incorporate the current revised detailed costing format.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:
COMPARATIVE SQ. FT. COSTS 1981 - 1991: CALGARY



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:
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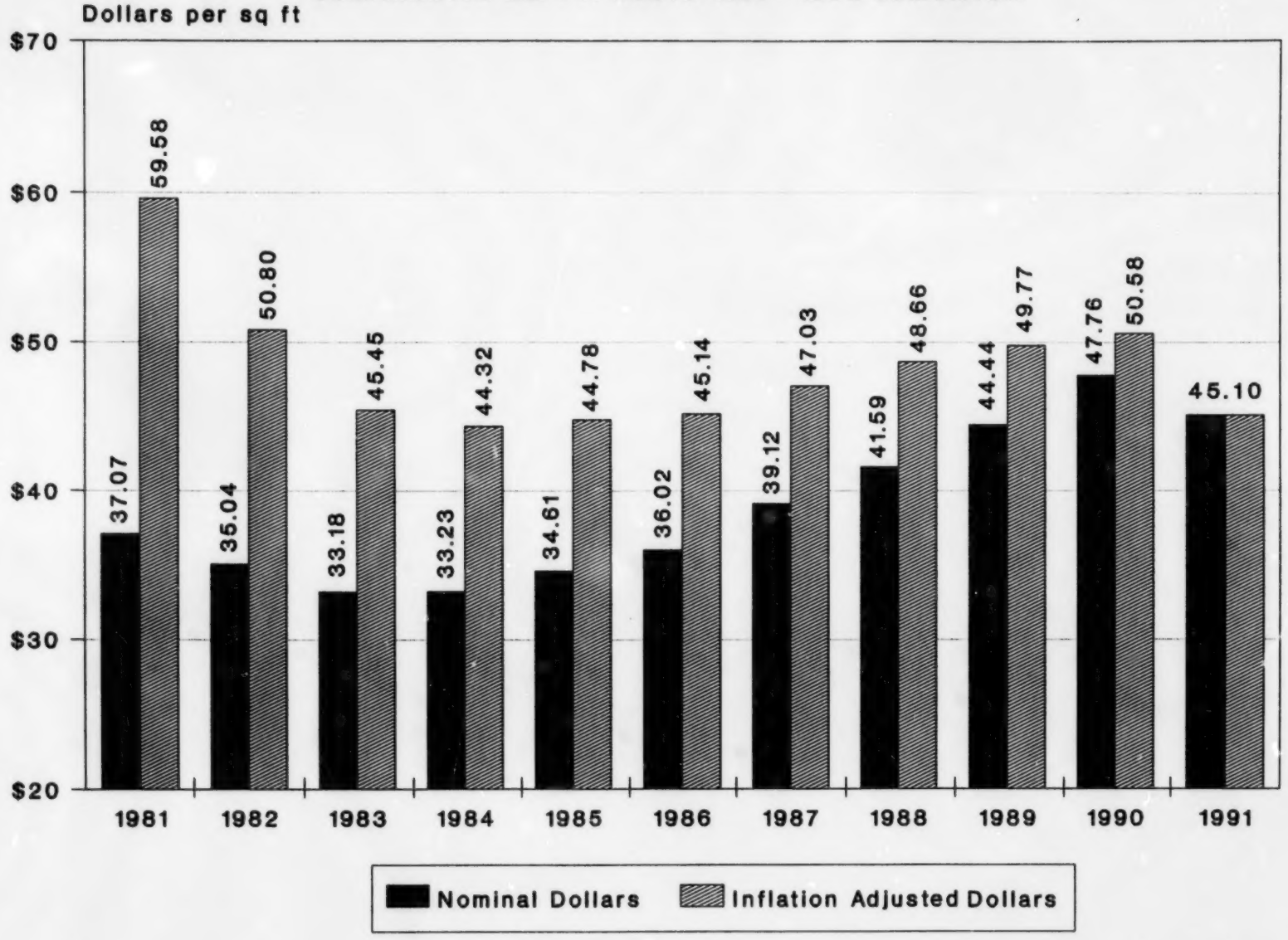
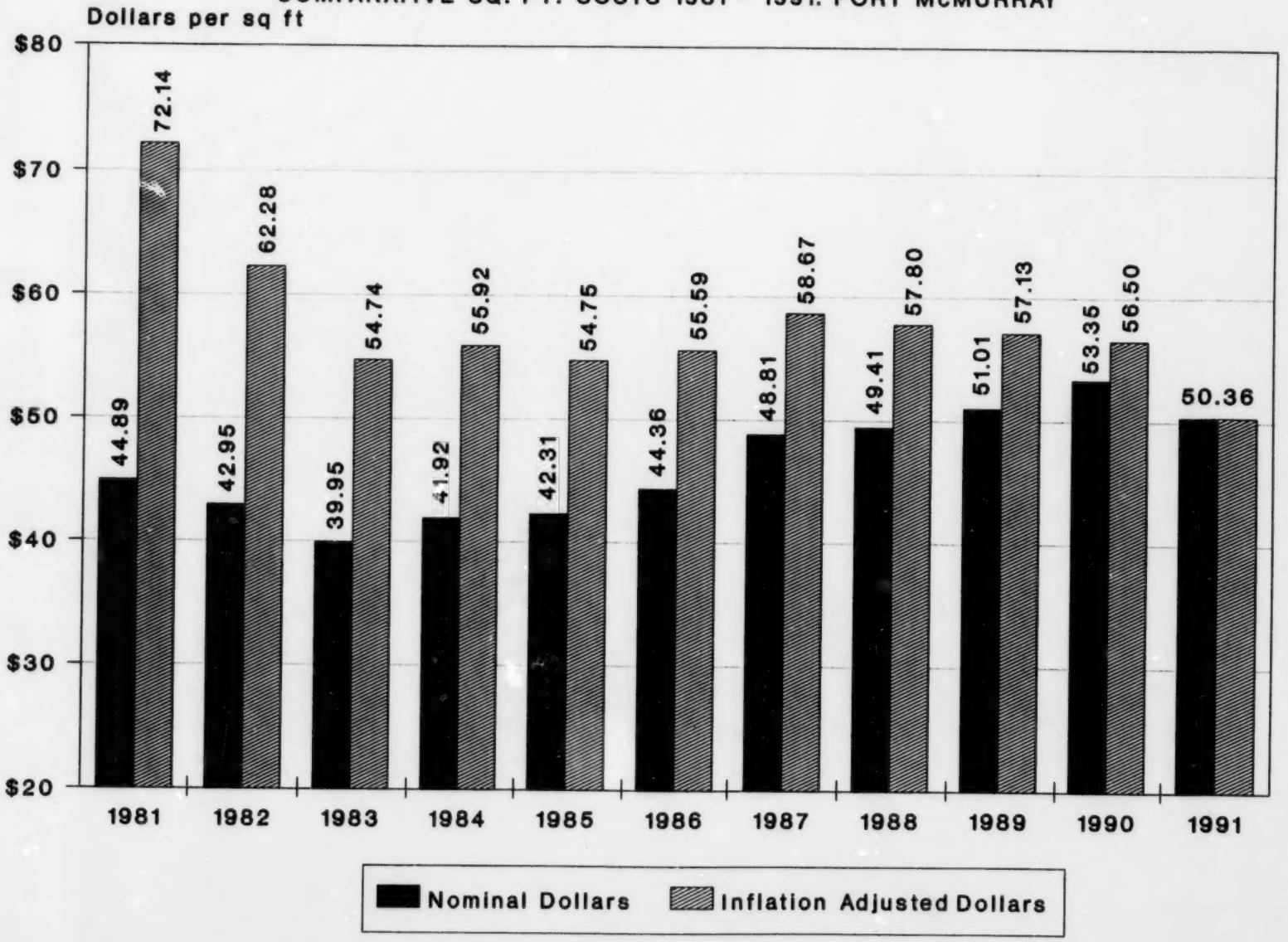


2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

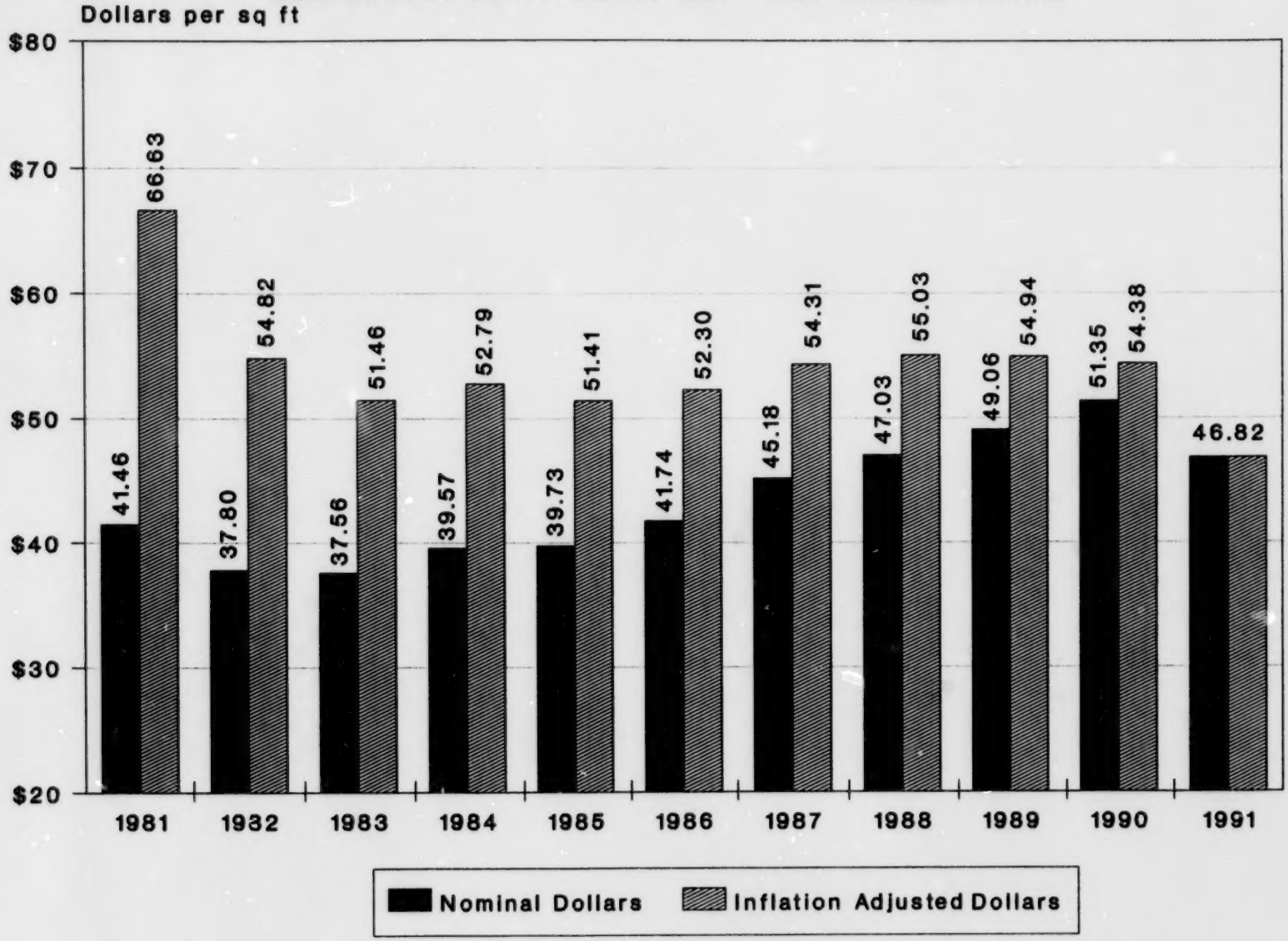
CHART SD.9:

COMPARATIVE SQ. FT. COSTS 1981 - 1991: FORT McMURRAY



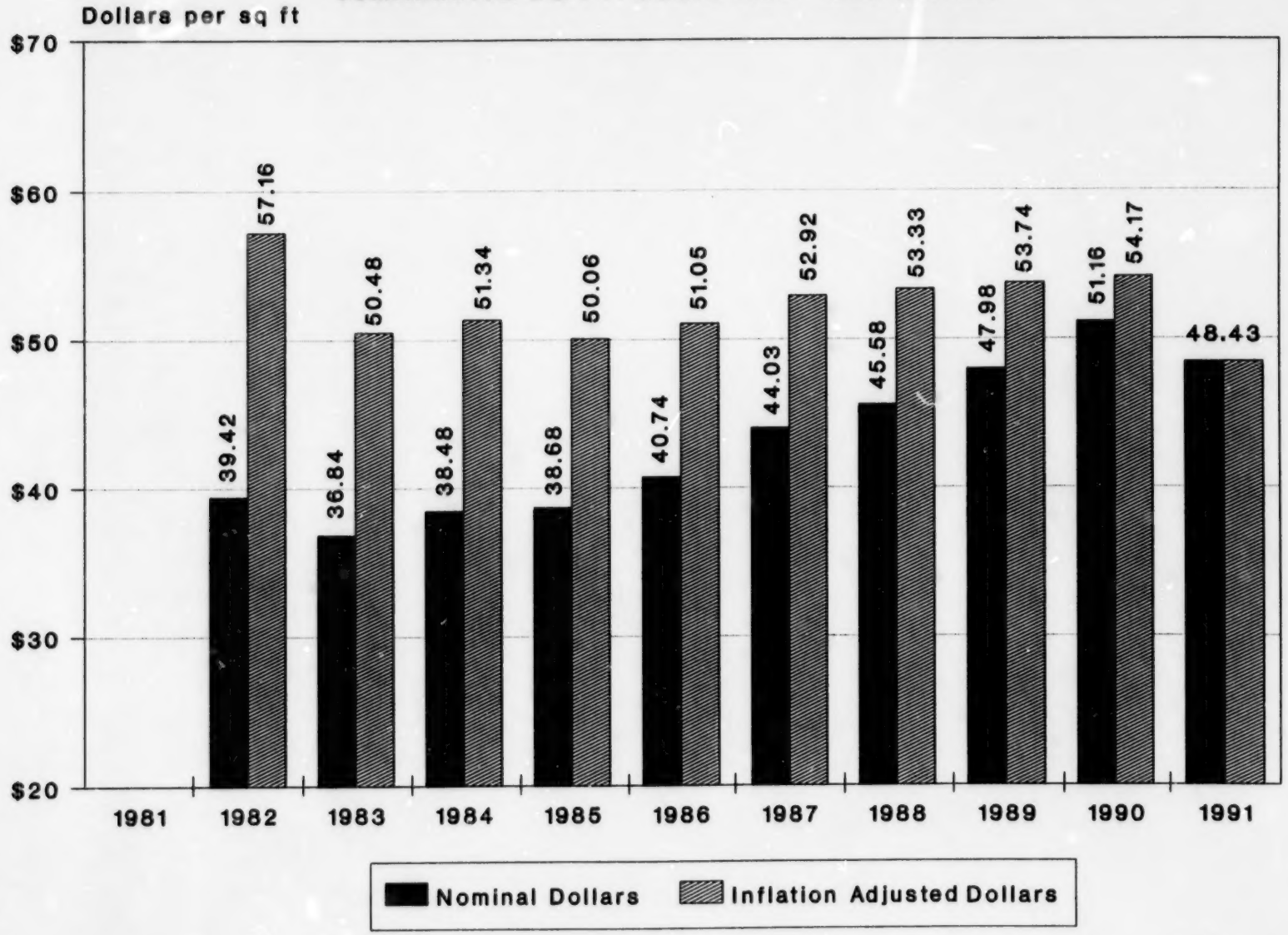
2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:
COMPARATIVE SQ. FT. COSTS 1981 - 1991: GRANDE PRAIRIE



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:
COMPARATIVE SQ. FT. COSTS 1981 - 1991: HINTON



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

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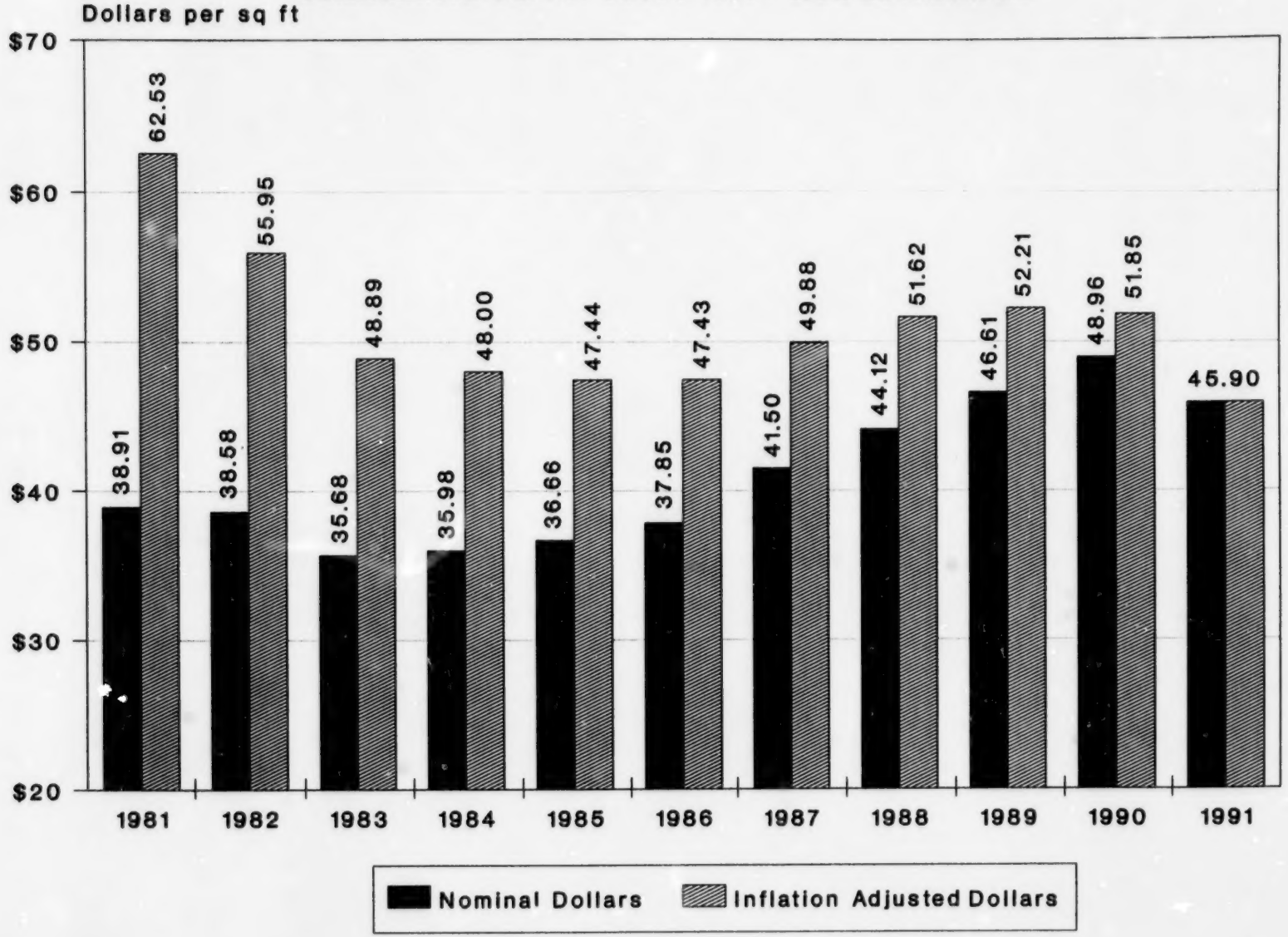
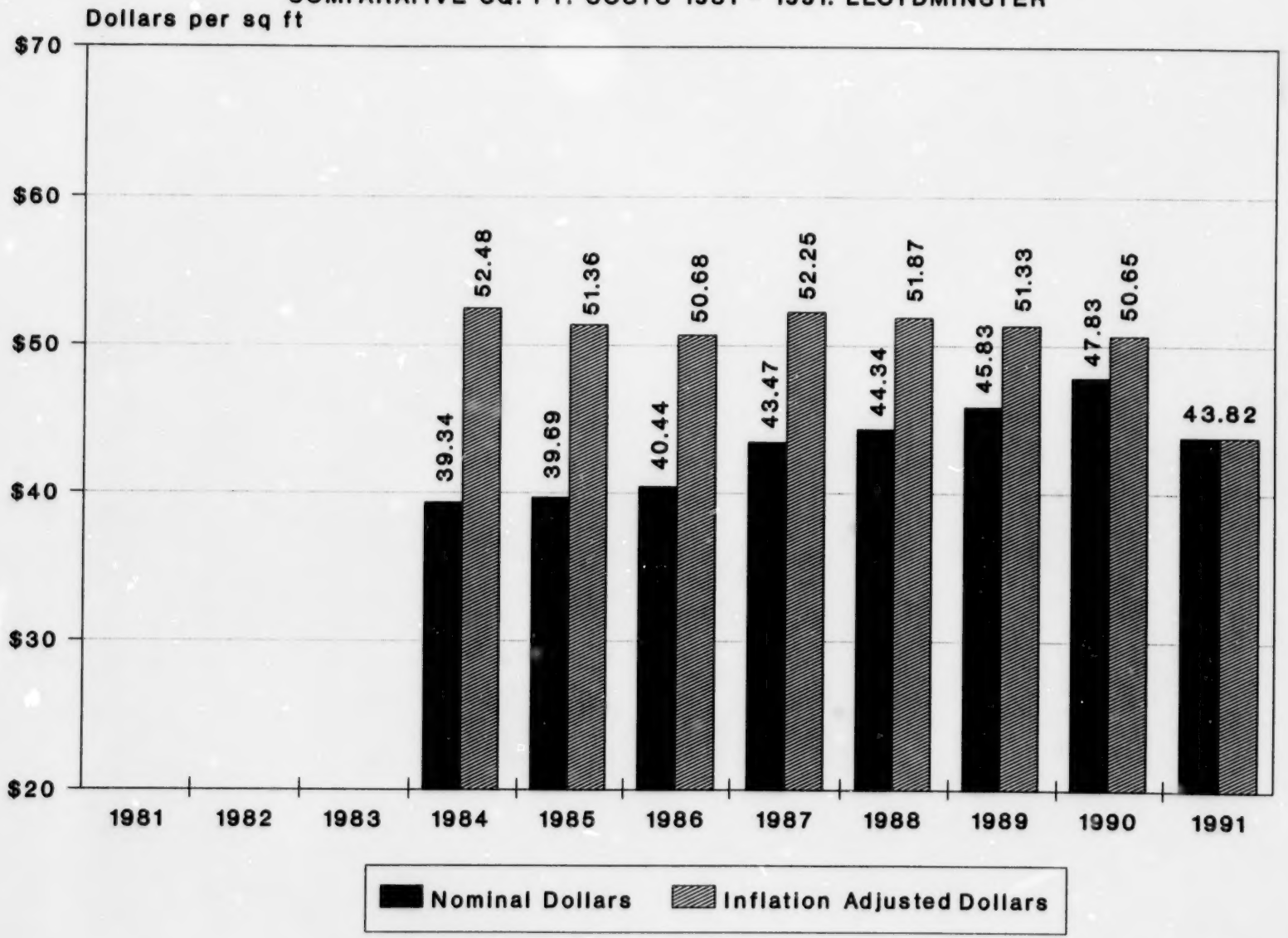
COMPARATIVE SQ. FT. COSTS 1981 - 1991: LETHBRIDGE



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

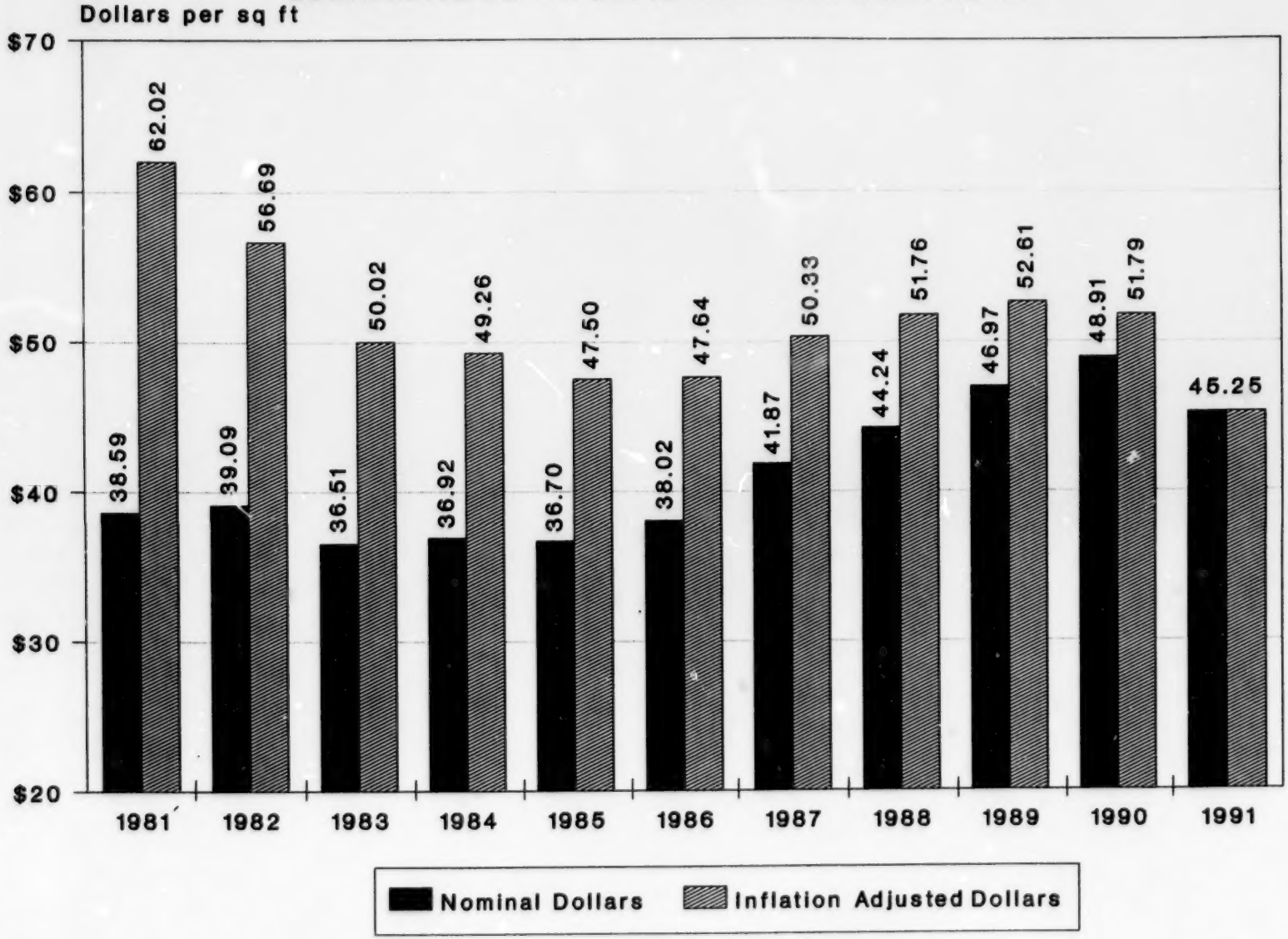
CHART SD.9:
COMPARATIVE SQ. FT. COSTS 1981 - 1991: LLOYDMINSTER



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:

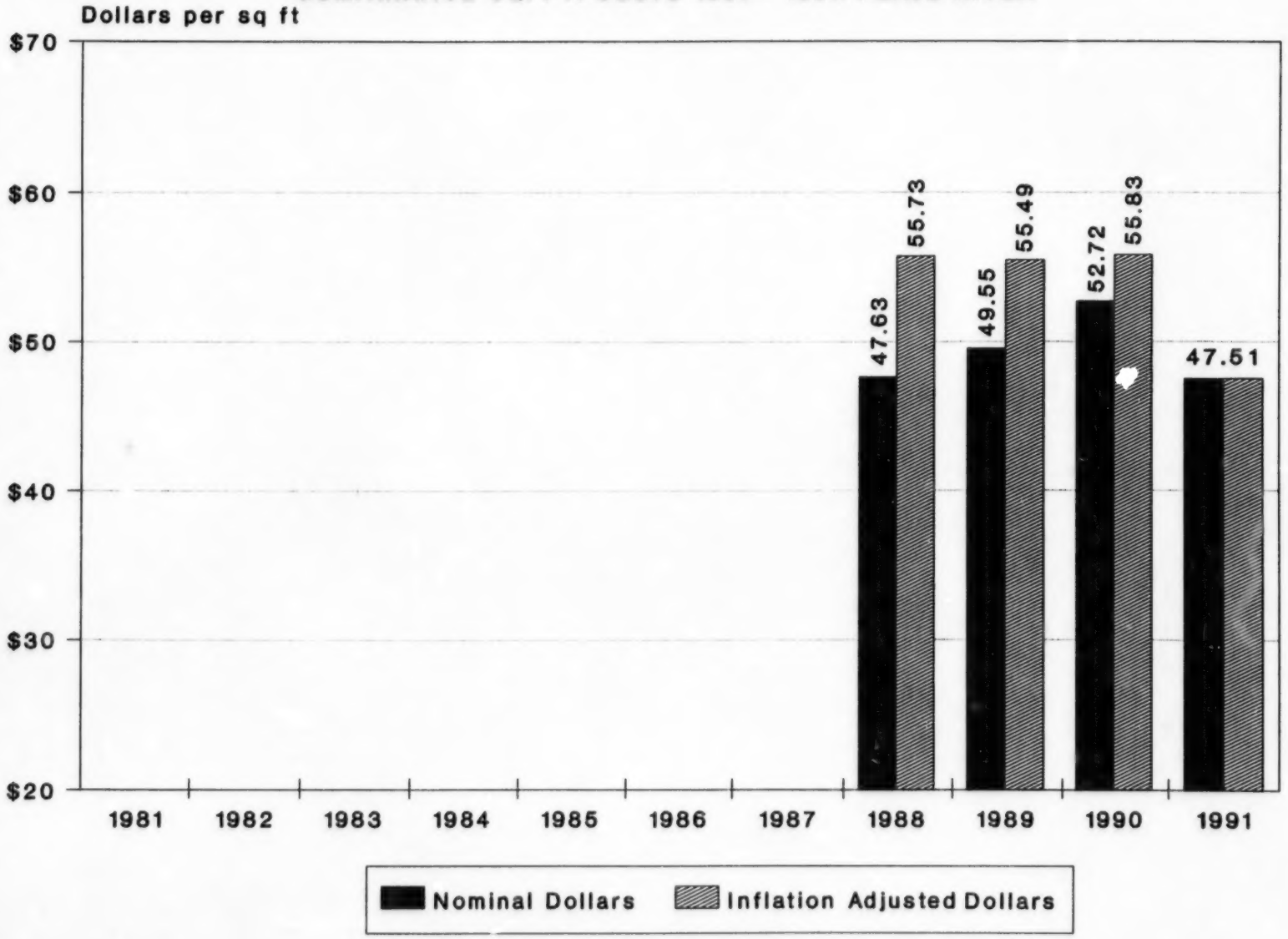
COMPARATIVE SQ. FT. COSTS 1981 - 1991: MEDICINE HAT



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

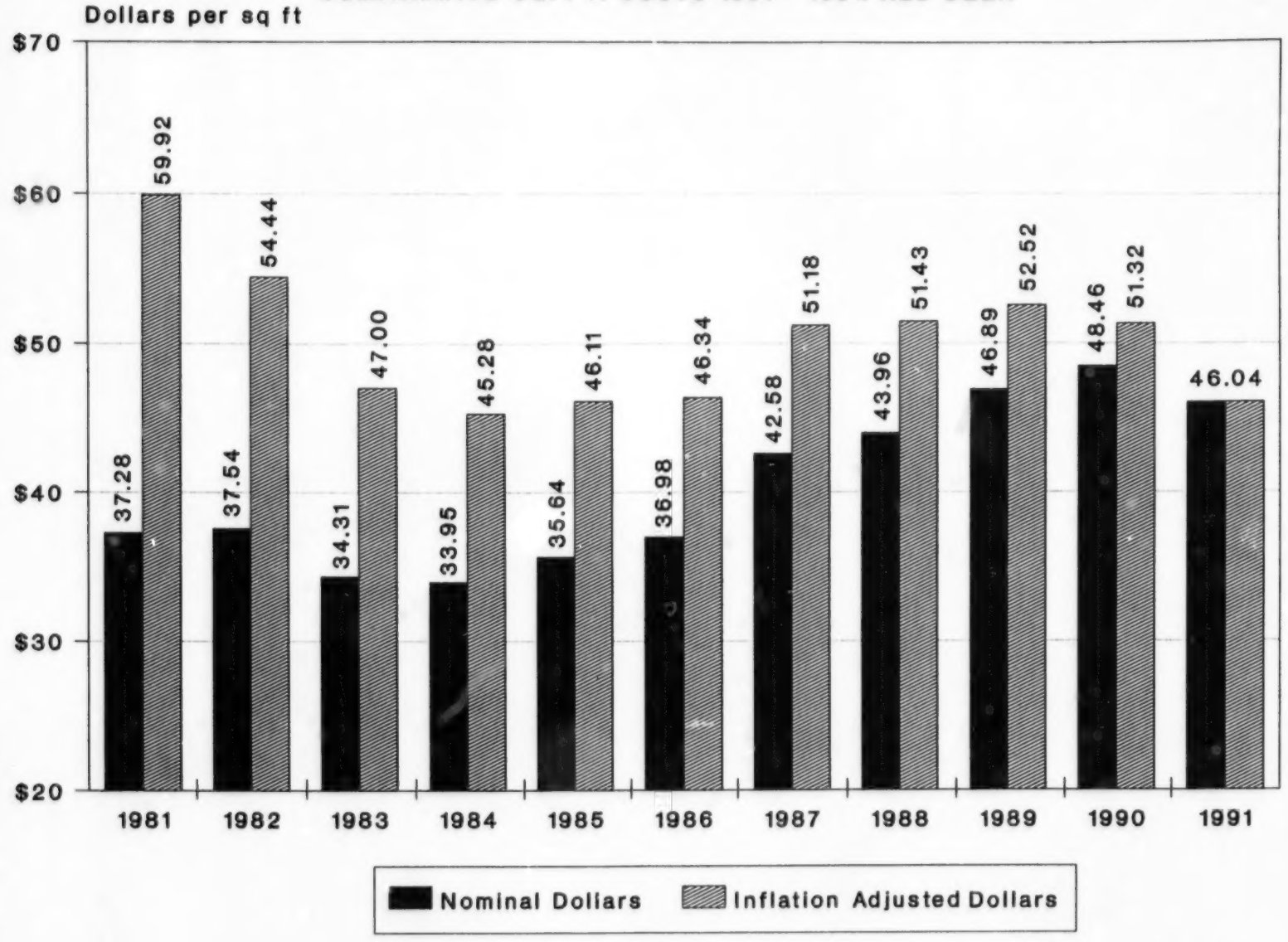
CHART SD.9:

COMPARATIVE SQ. FT. COSTS 1981 - 1991: PEACE RIVER



2.0 SUMMARY OF FINDINGS FOR THE SINGLE DETACHED DWELLING

CHART SD.9:
COMPARATIVE SQ. FT. COSTS 1981 - 1991: RED DEER



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 10 : Trade Division Cost Summaries

TRADE	CALGARY	EDMONTON	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	LLOYD-MINSTER	MEDICINE HAT	PEACE RIVER	RED DEER
1. Excavation & Backfill	2,078	2,050	2,256	1,561	2,036	2,096	1,782	2,290	1,692	2,167
2. Concrete & Gravel	8,400	8,802	10,534	9,791	10,333	8,513	7,854	8,886	9,032	9,138
3. Rough Carpentry	11,758	12,235	13,640	12,859	13,139	13,003	11,764	12,143	13,042	12,577
4. Roofing	1,260	1,305	1,350	1,278	1,170	1,224	1,134	1,260	1,224	1,359
5. Windows & Doors	4,349	4,790	5,362	4,832	4,777	4,940	4,859	4,900	5,597	4,684
6. Exterior Cladding	6,034	5,707	6,538	6,345	6,396	6,491	5,685	6,026	6,284	6,295
7. Plumbing	5,000	5,500	6,000	5,750	6,000	5,300	5,285	5,200	6,050	5,650
8. Electrical	3,550	3,800	4,000	3,850	4,200	3,250	3,750	3,400	3,650	3,575
9. Heating	2,700	2,700	3,200	2,850	3,050	2,800	2,800	2,610	2,900	2,775
10. Specialty Items	2,351	2,326	2,674	2,652	2,570	2,551	2,472	2,605	2,608	2,445
11. Drywall, Insulation, Caulk	5,961	6,045	6,248	5,980	6,256	6,113	6,295	6,234	5,982	6,076
12. Cabinets & Vanities	4,205	4,035	4,595	4,145	4,180	4,357	4,060	4,235	4,395	3,945
13. Painting, Stain & Lacquer	2,559	2,584	2,805	2,644	2,663	2,563	2,564	2,564	2,806	2,669
14. Interior Finishing	4,352	4,308	4,773	4,382	4,488	4,339	4,299	4,293	4,570	4,422
15. Floor Coverings	2,814	2,732	3,457	3,240	3,088	3,007	2,795	2,875	3,357	2,795
16. Miscellaneous	1,490	1,220	890	660	985	835	750	855	710	1,040
Goods & Services Tax	3,085	3,142	3,509	3,262	3,375	3,198	3,053	3,153	3,311	3,208
TOTALS	$71,946	$73,281	$81,831	$76,081	$78,706	$74,580	$71,201	$73,529	$77,210	$74,820

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA. 1 : Total Building Costs

ITEM	CALGARY	EDMONTON
Labour	$287,767 37.8%	$297,002 37.9%
Material	$473,507 62.2%	$486,828 62.1%
Total 1991	$761,274	$783,830
Cost / m2	$409.95	$422.09
Cost / SF	$38.09	$39.21
Cost / SF 1990	$41.64	$41.24
Total 1990	$832,328	$824,241
% Change From 1990	-8.5%	-4.9%

TABLE WA. 2 : Comparative Cost Ratios

LOCATION	CALGARY	EDMONTON
CALGARY	1.00	1.03
EDMONTON	0.97	1.00

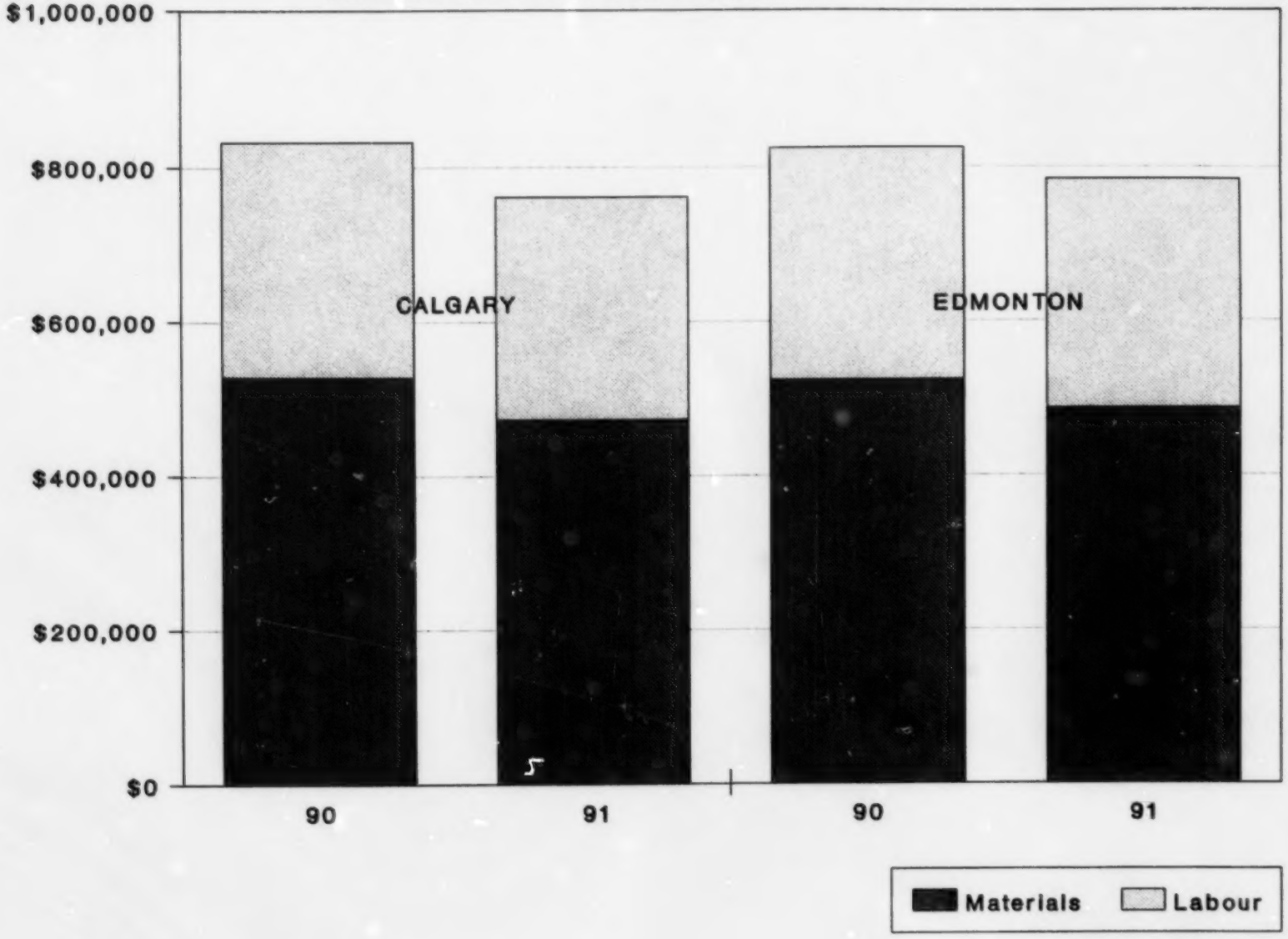
TABLE WA. 3 : Comparative Costs 1990 - 1991

LOCATION	CALGARY	EDMONTON
Labour Cost		
1991	$287,767	$297,002
1990	$304,190	$300,349
Difference	($16,423)	($3,347)
% Difference	-5.4%	-1.1%
Material Cost		
1991	$473,507	$486,828
1990	$528,138	$523,892
Difference	($54,631)	($37,064)
% Difference	-10.3%	-7.1%
Total Cost		
1991	$761,274	$783,830
1990	$832,328	$824,241
Difference	($71,054)	($40,411)
% Difference	-8.5%	-4.9%

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

CHART WA. 4:

COMPARATIVE COSTS BAR CHART 1990 - 1991



3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK–UP APARTMENT

TABLE WA. 5 : Comparative Total Building Costs 1981 – 1991 (Nominal Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$716,748	$719,003	$714,492
1982	$646,559	$627,844	$665,273
1983	$597,610	$592,174	$603,046
1984	$595,950	$591,861	$600,039
1985	$621,512	$617,049	$625,974
1986	$647,835	$647,135	$648,534
1987	$709,010	$724,502	$693,517
1988	$735,201	$744,420	$725,982
1989	$786,666	$792,405	$780,927
1990	$828,285	$832,328	$824,241
1991	$772,552	$761,274	$783,830

TABLE WA. 6 : Comparative Total Building Costs 1981 – 1991 (Inflation Adjusted Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$1,151,813	$1,155,438	$1,148,189
1982	$937,510	$910,374	$964,646
1983	$818,726	$811,278	$826,173
1984	$794,997	$789,543	$800,452
1985	$804,236	$798,461	$810,010
1986	$811,737	$810,860	$812,613
1987	$852,229	$870,851	$833,607
1988	$860,185	$870,971	$849,399
1989	$881,066	$887,494	$874,638
1990	$877,153	$881,435	$872,871
1991	$772,552	$761,274	$783,830

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA. 7 : Comparative Costs Per Apartment Unit 1981 – 1991 (Nominal Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$29,865	$29,958	$29,771
1982	$26,940	$26,160	$27,720
1983	$24,901	$24,674	$25,127
1984	$24,832	$24,661	$25,002
1985	$25,896	$25,710	$26,082
1986	$26,993	$26,964	$27,022
1987	$29,543	$30,188	$28,897
1988	$30,634	$31,018	$30,249
1989	$32,778	$33,017	$32,539
1990	$34,512	$34,680	$34,343
1991	$32,190	$31,720	$32,660

TABLE WA. 8 : Comparative Costs Per Apartment Unit 1981 – 1991 (Inflation Adjusted Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$47,992	$48,143	$47,842
1982	$39,063	$37,932	$40,194
1983	$34,114	$33,803	$34,424
1984	$33,125	$32,898	$33,353
1985	$33,509	$33,269	$33,750
1986	$33,822	$33,786	$33,859
1987	$35,510	$36,286	$34,734
1988	$35,841	$36,291	$35,391
1989	$36,711	$36,979	$36,444
1990	$36,548	$36,726	$36,369
1991	$32,190	$31,720	$32,660

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA. 9 : Comparative Square Foot Unit Costs 1981 – 1991 (Nominal Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$35.86	$35.97	$35.75
1982	$32.35	$31.41	$33.28
1983	$29.90	$29.63	$30.17
1984	$29.81	$29.61	$30.02
1985	$31.09	$30.87	$31.32
1986	$32.41	$32.38	$32.45
1987	$35.47	$36.25	$34.70
1988	$36.78	$37.24	$36.32
1989	$39.36	$39.64	$39.07
1990	$41.44	$41.64	$41.24
1991	$38.65	$38.09	$39.21

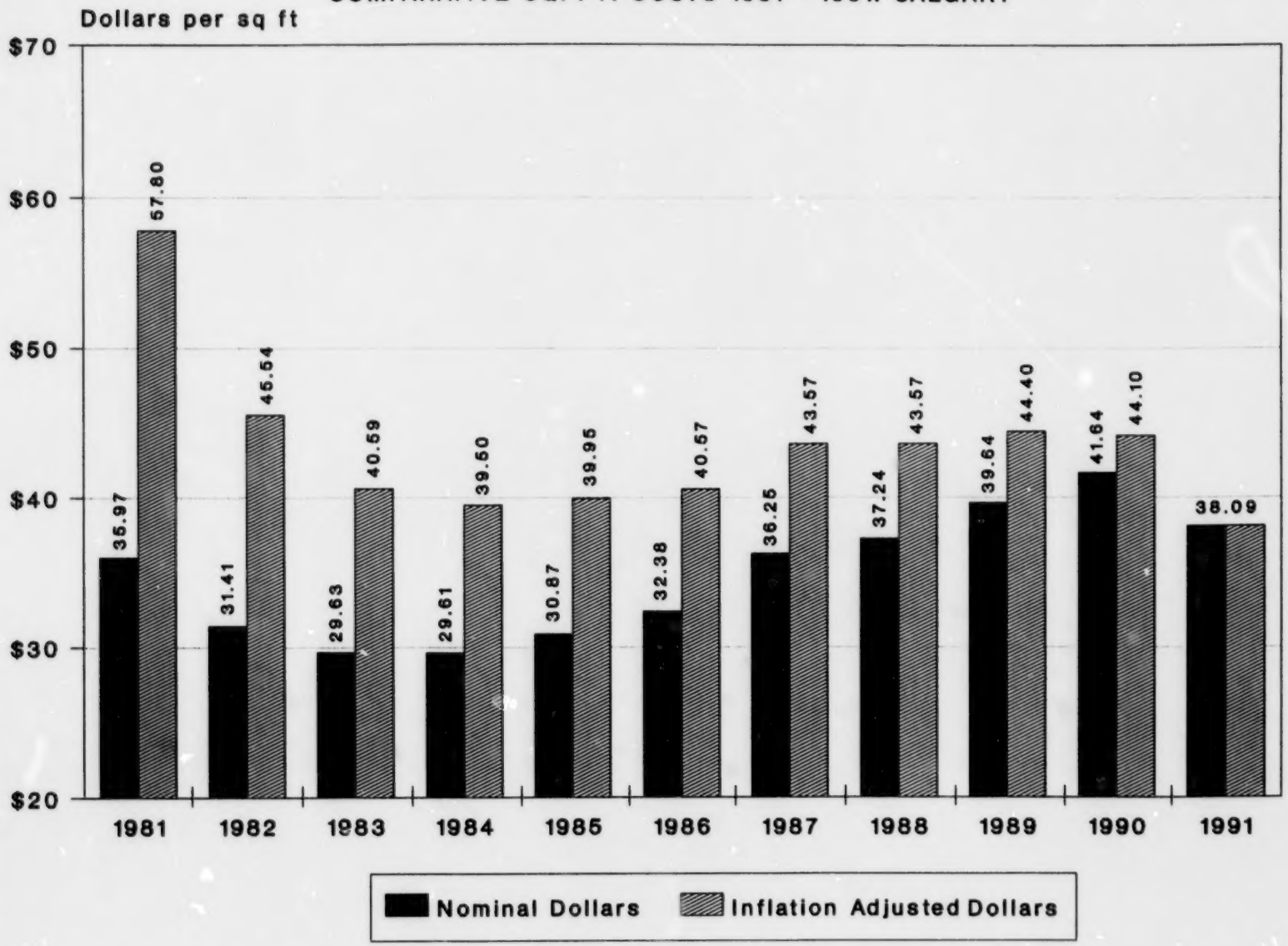
TABLE WA. 10 : Comparative Square Foot Unit Costs 1981 – 1991 (Inflation Adjusted Dollars)

YEAR	AVERAGE	CALGARY	EDMONTON
1981	$57.62	$57.80	$57.44
1982	$46.90	$45.54	$48.26
1983	$40.96	$40.59	$41.33
1984	$39.77	$39.50	$40.05
1985	$40.23	$39.95	$40.52
1986	$40.61	$40.57	$40.65
1987	$42.64	$43.57	$41.70
1988	$43.03	$43.57	$42.49
1989	$44.08	$44.40	$43.76
1990	$43.88	$44.10	$43.67
1991	$38.65	$38.09	$39.21

3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

CHART WA. 11:

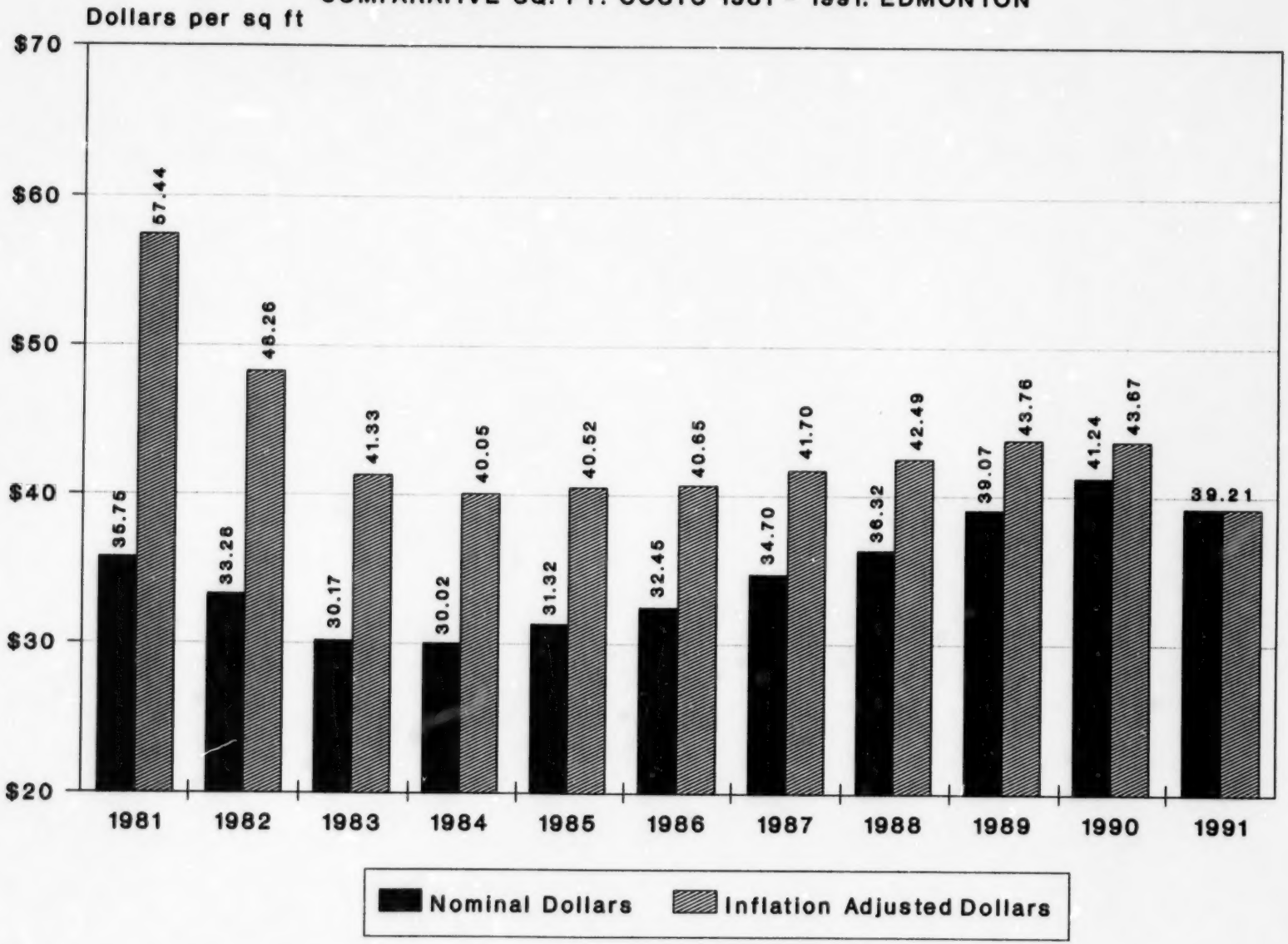
COMPARATIVE SQ. FT. COSTS 1981 - 1991: CALGARY



3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

CHART WA. 11:

COMPARATIVE SQ. FT. COSTS 1981 - 1991: EDMONTON



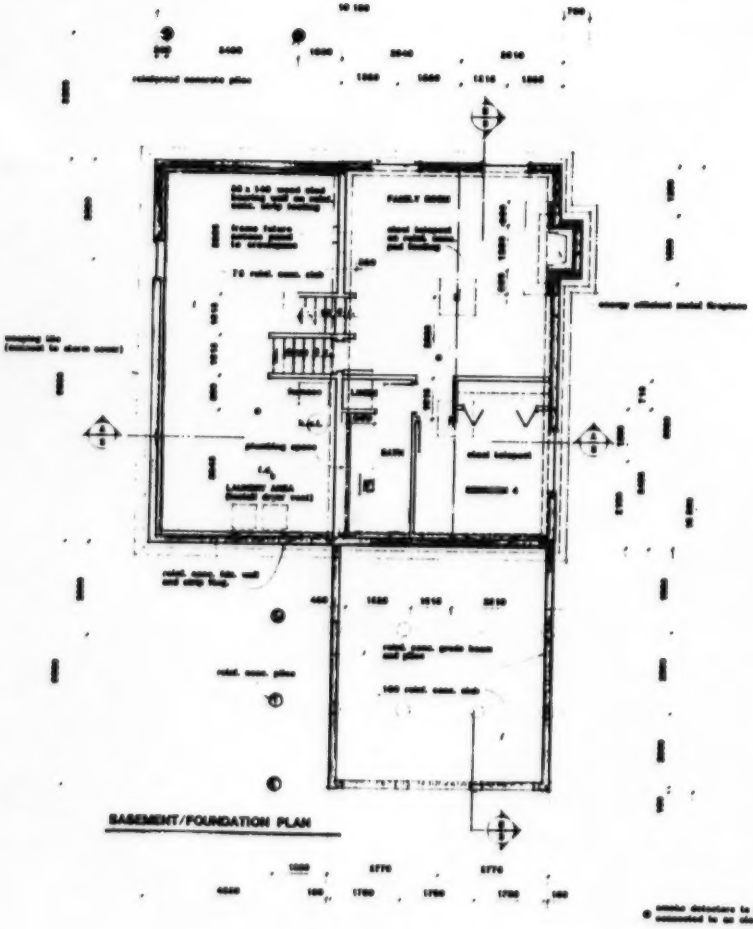
3.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA. 12 : Trade Division Cost Summaries

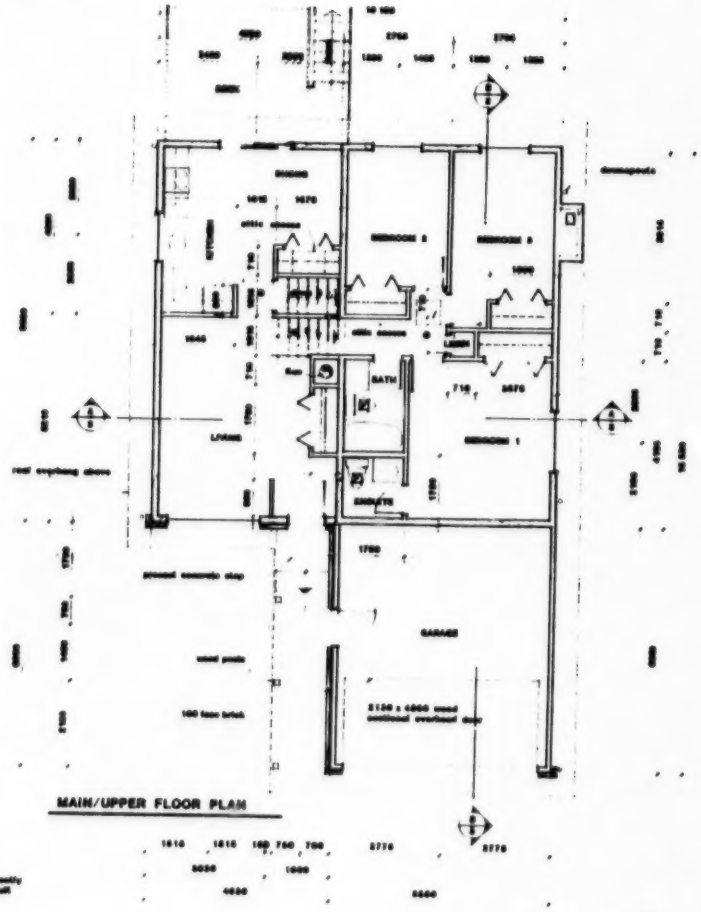
TRADE	CALGARY	EDMONTON
1. Excavation & Backfill	5,339	5,449
2. Concrete & Gravel	21,016	22,144
3. Rough Carpentry	82,209	85,881
4. Roofing	18,461	16,283
5. Windows & Doors	27,870	32,255
6. Exterior Cladding	16,720	16,206
7. Plumbing	58,080	64,320
8. Electrical	51,960	56,760
9. Heating	33,600	37,200
10. Ventilation	24,000	24,000
11. Fire Protection	2,496	2,760
12. Specialty Items	14,272	13,294
13. Drywall, Insulation & Caulking	53,757	54,474
14. Cabinets & Vanities	49,410	48,435
15. Interior Finishing	54,439	54,674
16. Painting, Stain & Lacquer	20,608	20,690
17. Floor Coverings	50,914	50,006
18. Ceramic Tile	5,480	5,480
19. Appliances	35,240	35,240
20. Site Overhead	44,500	44,500
21. General Contractor's Overhead & Profit	41,100	42,500
Subtotal	$711,471	$732,551
Goods & Services Tax	49,803	51,279
TOTALS	$761,274	$783,830

APPENDIX A

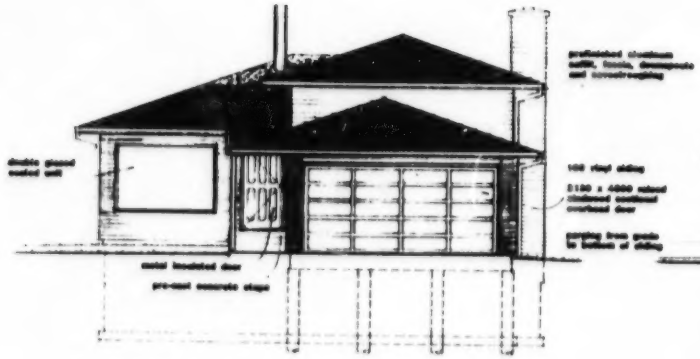
REDUCED DRAWINGS – SINGLE DETACHED DWELLING



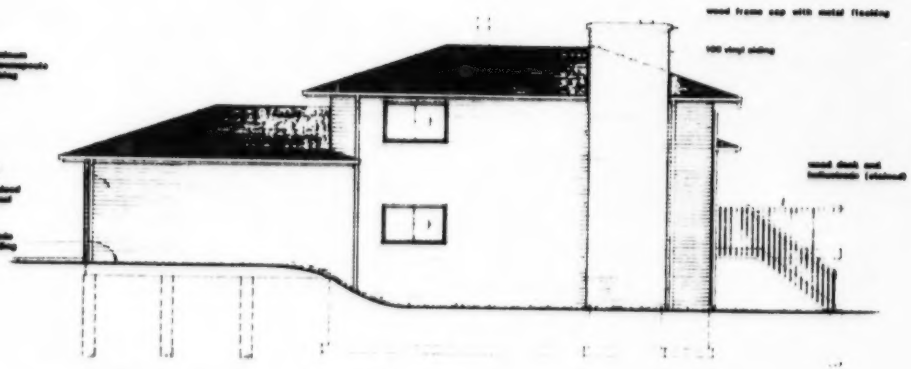
BASEMENT/FOUNDATION PLAN



MAIN/UPPER FLOOR PLAN

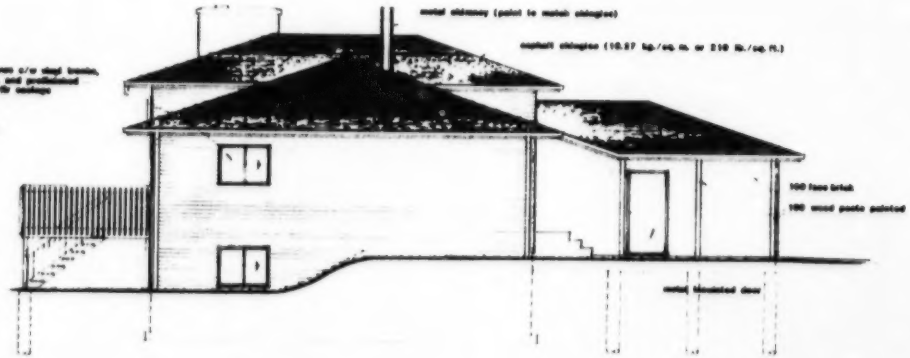


FRONT ELEVATION

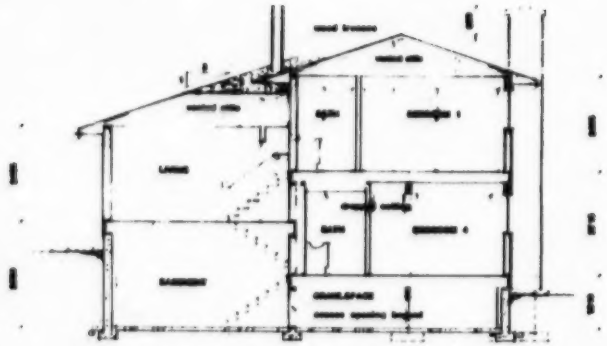


RIGHT SIDE ELEVATION

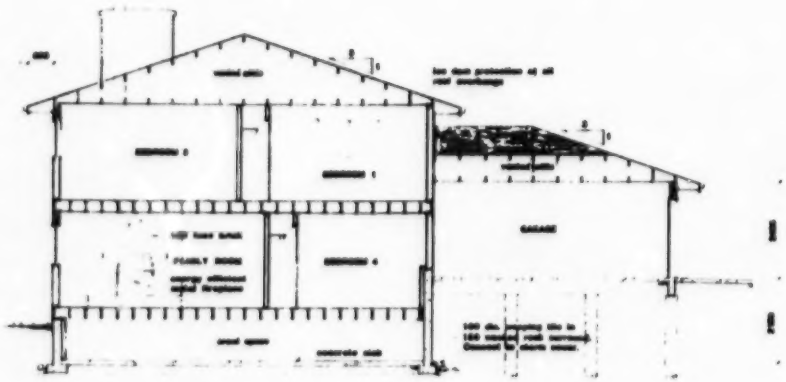
BACK ELEVATION



LEFT SIDE ELEVATION



BUILDING CROSS SECTION



BUILDING CROSS SECTION

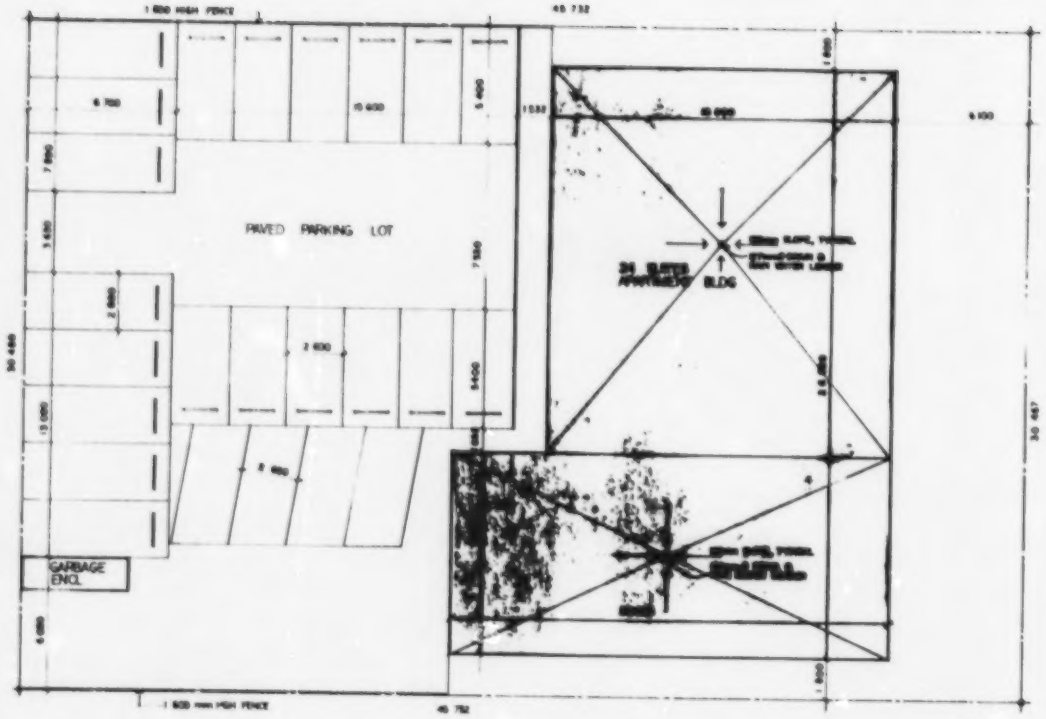
SPECIFICATIONS

FOUNDATIONS

- 20 Mpa, type 50 concrete to 400 x 300 reinforced concrete footings
- 20 Mpa, type 20 concrete to 200mm dp concrete foundation walls c/w 2 rows of 15M rebar
- 20 Mpa concrete basement floor slab 75mm thick over 6 mil poly and 100mm compacted sand
- 100mm reinforced garage floor on compacted sand
- 600mm dia. reinforced concrete piles under garage floor and grade beam
- 600mm dia. reinforced concrete piles under garage floor and grade beam
- 600mm dia. reinforced concrete piles under garage floor and grade beam

APPENDIX B

REDUCED DRAWINGS – 24 UNIT WALK-UP APARTMENT



STATISTICS

SITE AREA 1?9m²

SUITES 2? ONE BEDROOM

BUILDING AREA ?65m²

PARKING 2? CARS

THE BUILDING IS REQUIRED TO FACE AT LEAST ONE STREET.

ACCESS WALL PANELS (OR WINDOW SHAFT) IS PROVIDED ON SECOND AND THIRD FLOOR IN AT LEAST 1 WALL FACING ON A STREET.

SPECIAL SEPARATIONS BETWEEN BUILDINGS

For [illegible] PERCENTAGE OF UNPROTECTED [illegible] BUILDING FACE [illegible] TO AND TO THE NEIGHBOURING BUILDING [illegible] A MINIMUM LOSS [illegible] IS AS [illegible]

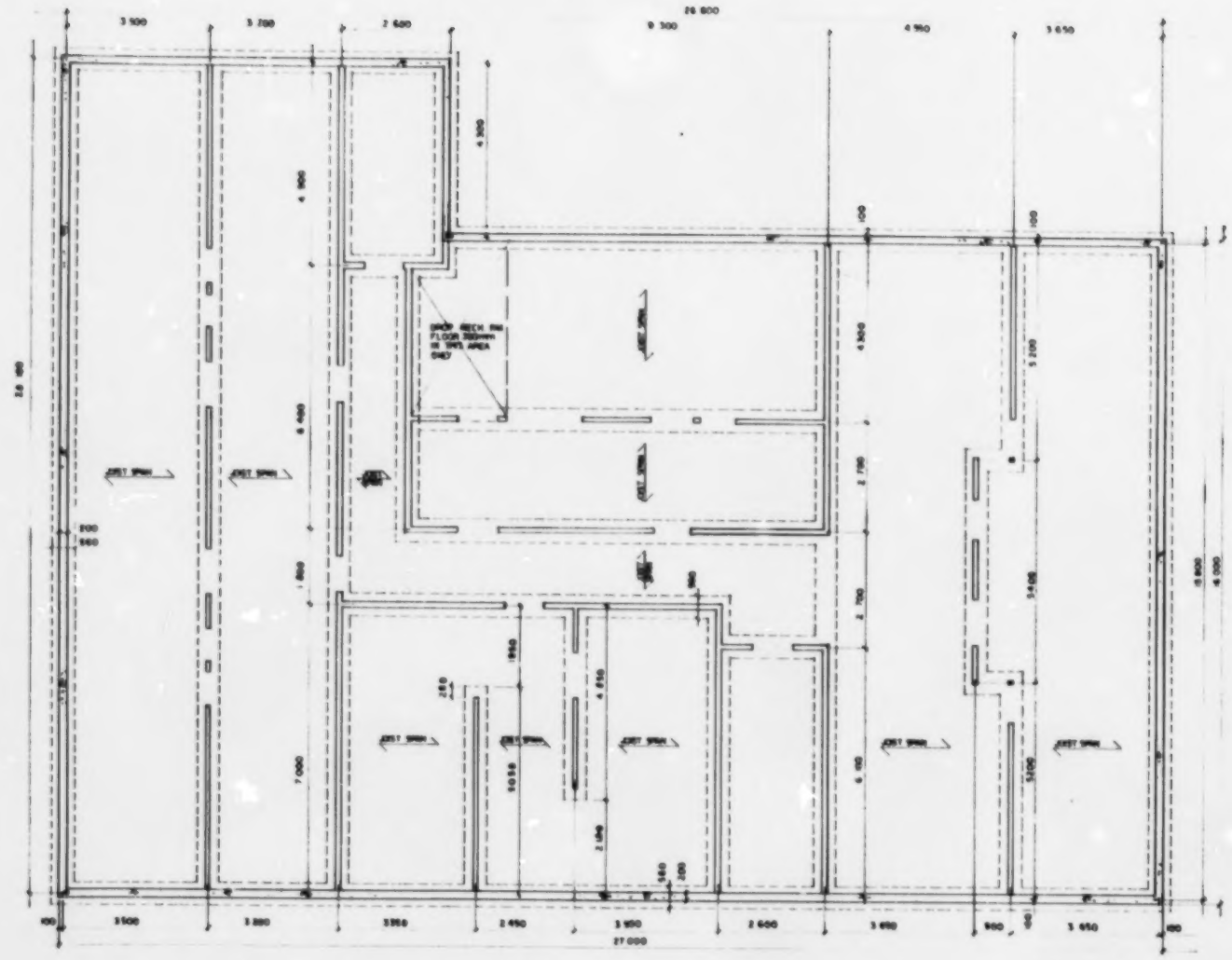
[illegible] STAMPED DRAWING SHALL BE [illegible] AT THE [illegible] FOR INSPECTION BY [illegible]

ALBERTA HOUSE COST COMPARISON STUDY

SITE PLAN

SCALE 1:400

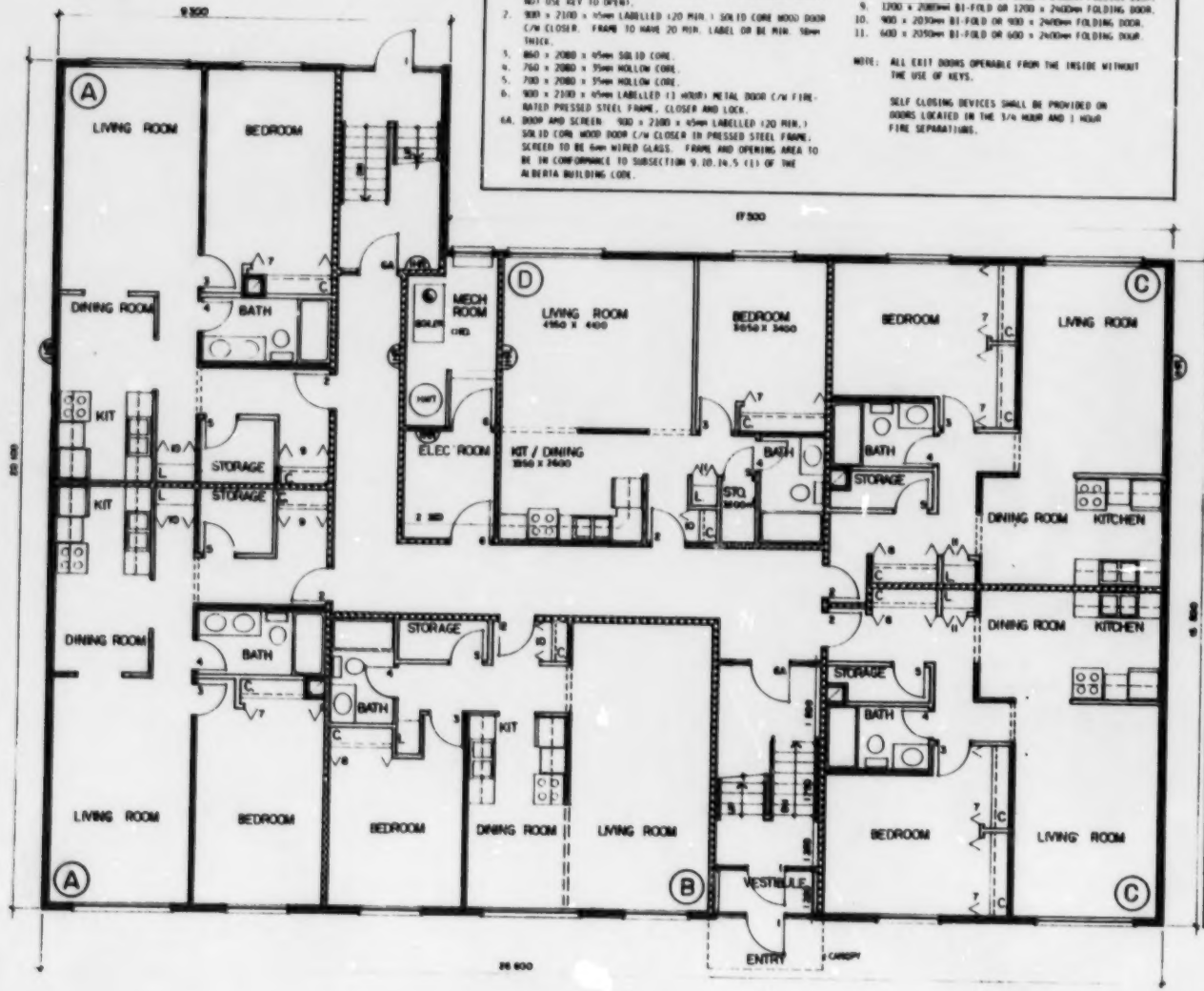
0 1 2 3 4 5 6 7 8 9 10m



ALBERTA HOUSE COST COMPARISON STUDY

FOUNDATION PLAN

SCALE 1:50



DOOR SCHEDULE

1. 920 x 2100mm ALUMINUM GLAZED DOOR C/W DOOR CLOSER, PUSH AND PULL, LOCK AND THRESHOLD. (NOTE: FROM INSIDE SHOULD NOT USE KEY TO OPEN).
2. 920 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER. FRAME TO HAVE 20 MIN. LABEL OR BE MIN. 58mm THICK.
3. 860 x 2080 x 45mm SOLID CORE.
4. 760 x 2080 x 35mm HOLLOW CORE.
5. 710 x 2080 x 35mm HOLLOW CORE.
6. 920 x 2100 x 45mm LABELLED (1 HOUR) METAL DOOR C/W FIRE-RATED PRESSED STEEL FRAME, CLOSER AND LOCK.

6A. DOOR AND SCREEN: 920 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER IN PRESSED STEEL FRAME. SCREEN TO BE 6mm WIRED GLASS. FRAME AND OPENING AREA TO BE IN CONFORMANCE TO SUBSECTION 9.20.14.5 (1) OF THE ALBERTA BUILDING CODE.

7. 1870 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR.
8. 1490 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR.
9. 1290 x 2080mm BI-FOLD OR 1290 x 2400mm FOLDING DOOR.
10. 900 x 2030mm BI-FOLD OR 900 x 2400mm FOLDING DOOR.
11. 600 x 2050mm BI-FOLD OR 600 x 2400mm FOLDING DOOR.

NOTE: ALL EXIT DOORS OPENABLE FROM THE INSIDE WITHOUT THE USE OF KEYS.

SELF CLOSING DEVICES SHALL BE PROVIDED ON DOORS LOCATED IN THE 3/4 HOUR AND 1 HOUR FIRE SEPARATIONS.

WALL LEGEND

EXTERIOR STUD WALL C/W 38 x 38mm STRAPPING TO FOUNDATION WALL: SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 3.5 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD.

(1HR) EXTERIOR STUD WALL: 1 HOUR FIRE RESISTANCE RATING, C/W 38 x 38mm STRAPPING TO FOUNDATION WALL: NON-COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 3.5 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kG/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.

EXTERIOR STUD WALL: SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD.

(1HR) EXTERIOR STUD WALL: 1 HOUR FIRE RESISTANCE RATING, NON-COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kG/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.

INTERIOR WALL (3/4 HOUR FIRE SEPARATION): 2 ROWS OF 38 x 89mm STUDS, EACH SET @ 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kG/m² ON EACH SIDE, 12.7mm GYPSUM BOARD, BOTH SIDES.

INTERIOR WALL: 12.7mm GYPSUM BOARD BOTH SIDES OF 38 x 140mm STUDS.

INTERIOR WALL (3/4 HOUR FIRE RESISTANCE RATING) 38 x 89mm STUDS @ 400mm O.C. (BASEMENT - 38 x 140mm STUDS) AND 12.7mm TYPE X GYPSUM BOARD, BOTH SIDES.

(1HR) INTERIOR WALL: (1 HOUR FIRE SEPARATION) 2 ROWS OF 38 x 89mm STUDS, EACH SET @ 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE ON EACH SIDE, 15.9mm TYPE X GYPSUM BOARD, BOTH SIDES.

(1HR) INTERIOR WALL (1 HOUR FIRE SEPARATION) 38 x 140mm STUDS @ 400mm O.C. AND 15.9mm TYPE X GYPSUM BOARD BOTH SIDES.

INTERIOR WALL: 38 x 89mm STUDS AT 400mm O.C. AND 12.7mm GYPSUM BOARD, BOTH SIDES.

DROP BEAM

NOTES

- DOUBLE STUDS UNDER ALL BEARING POINTS AND ALL OPENINGS.
- LINTELS: 2 - 38 x 235mm BUILT-UP LINTEL, HORIZONTALLY ABOVE ALL OPENINGS.
- BALCONY CANTILEVERED JOISTS SHALL EXTEND INTO BUILDING MINIMUM 2400mm.

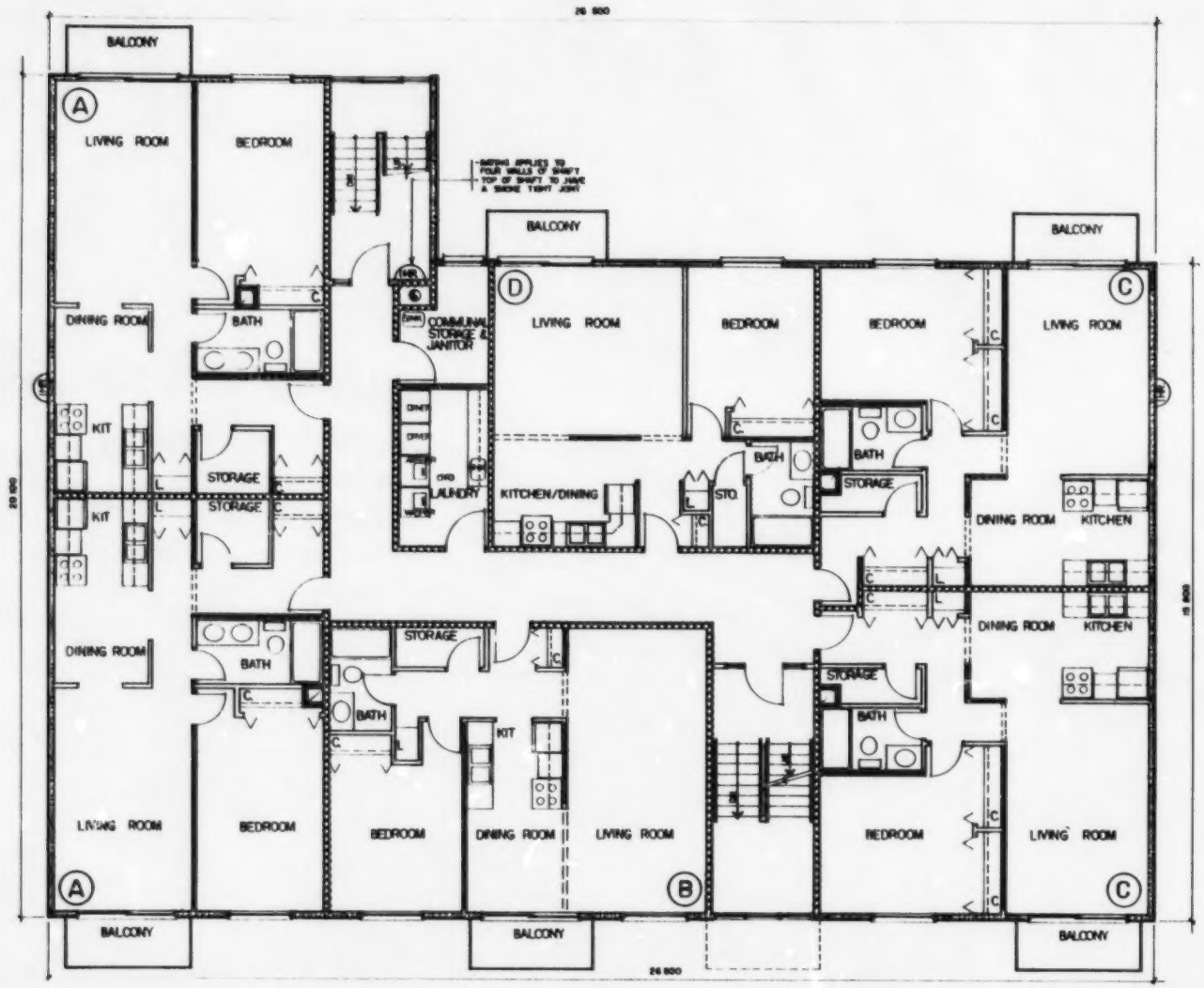
SHAFT ENCLOSURE: 3/4 FIRE RESISTANCE RATING AND STC OF 45, 15.9mm TYPE X GYPSUM BOARD, 57mm x .550mm THICK GALVANIZED STEEL I-STUDS AT 400mm O.C. AND J-TRACKS TOP AND BOTTOM, RESILIENT FURRING CHANNELS @ 600mm O.C., MINERAL WOOL INSULATION WITH DENSITY OF 1.2kG/m³, 19mm GYPSUM CORE BOARD.

ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN

SCALE 1:50

0 .5 1 2 3 4 5 6m

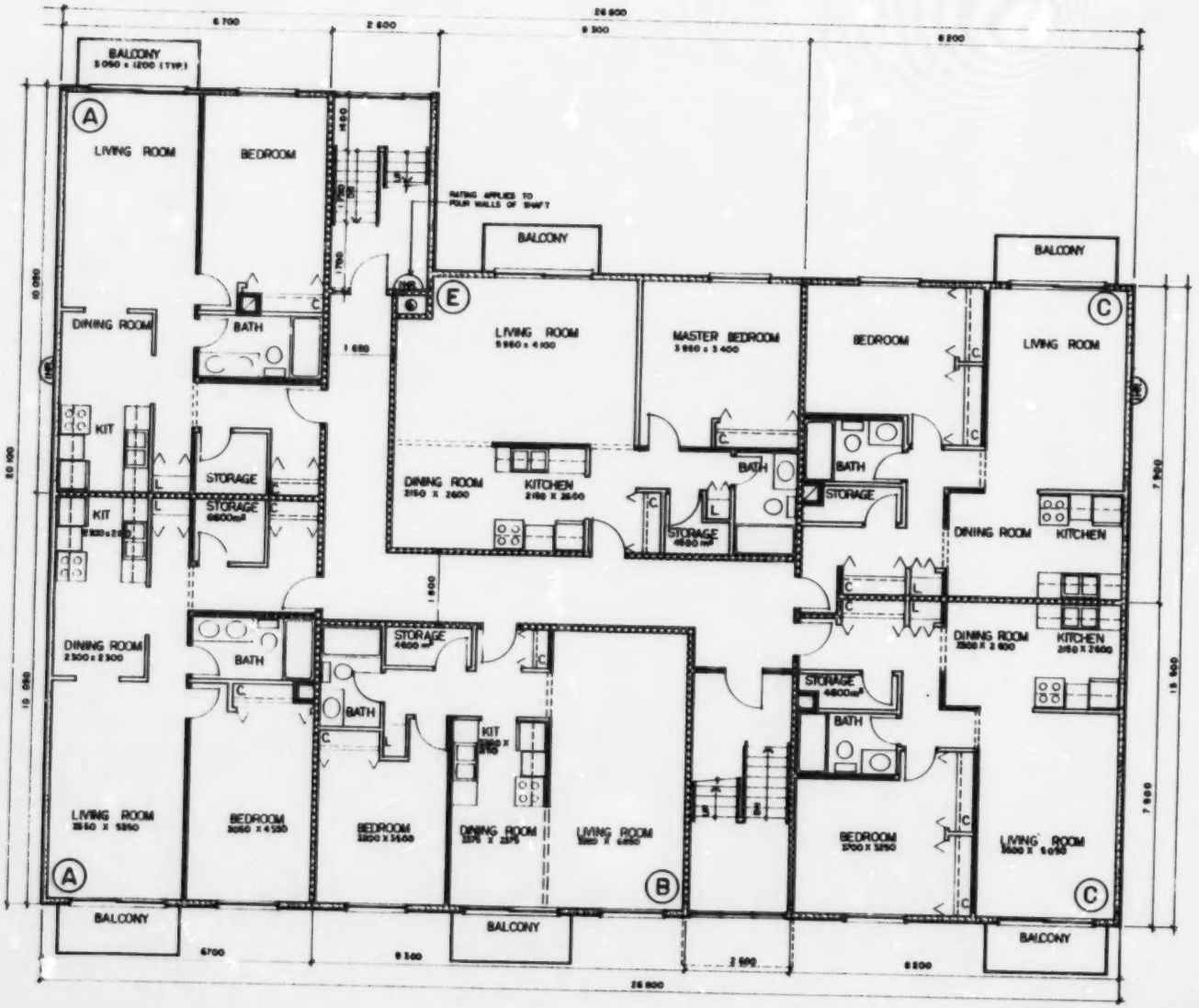


NOTE
SEE BASEMENT FLOOR PLAN FOR TYPICAL DOOR & BI-FOLD DOOR TYPES, SIZES & LOCATIONS

ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN

SCALE 1:50



NOTE
SEE BASEMENT FLOOR PLAN
FOR TYPICAL DOOR, BI-FOLD
DOOR TYPES, SIZES & LOCATIONS

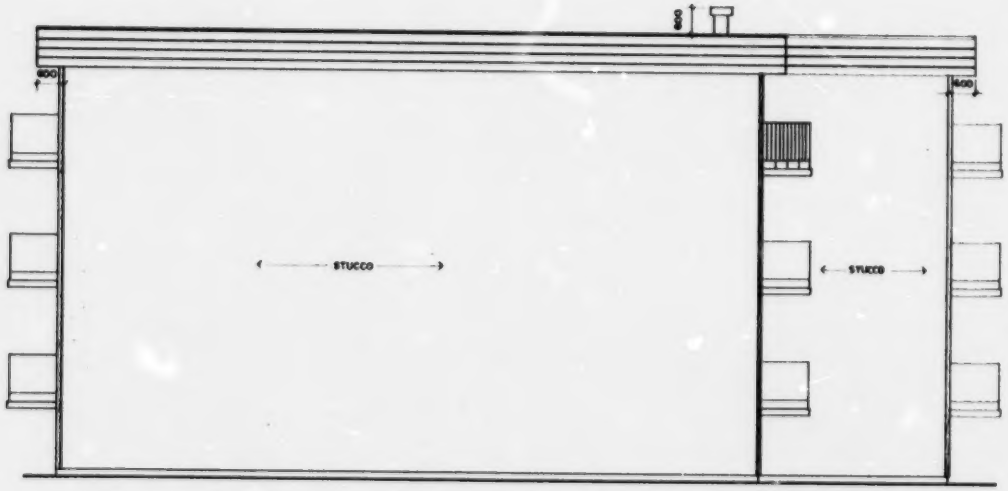
ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN

SCALE 1:50

METAL CHIMNEY
G.I. FLASHING PAINTED TO MATCH FASCIA
METAL FASCIA PAINTED WHITE
600
BALCONY GUARD - 1070mm HIGH, 970mm HIGH METAL PICKETS AT 100mm O.C. ; RAILING SECURED TO BALCONY DECK AT 1200mm O.C. MAX
STAINED DARK BROWN CEDAR COLUMN
STUCCO
CANOPY
PAVING

FRONT ELEVATION



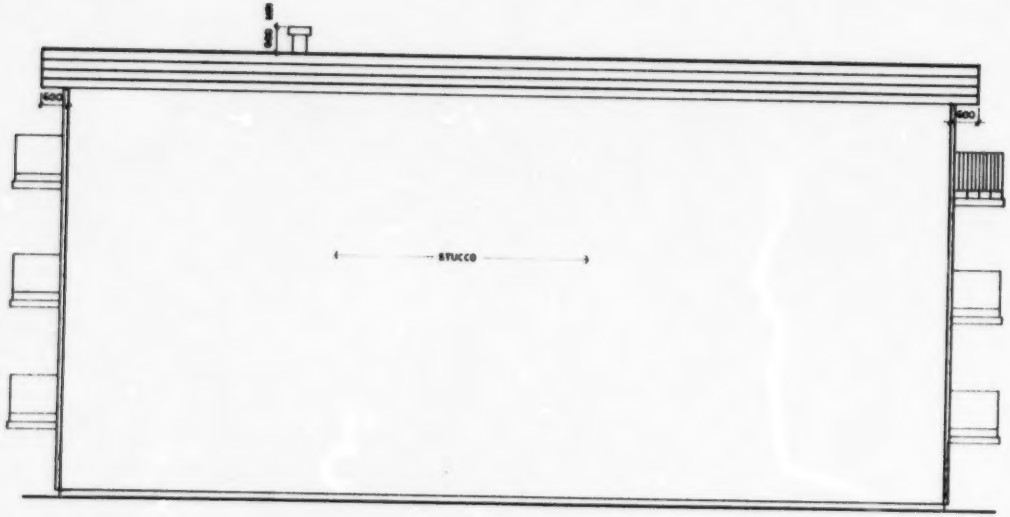
RIGHT ELEVATION

ALBERTA HOUSE COST COMPARISON STUDY

ELEVATIONS

SCALE 1:50

REAR ELEVATION



LEFT ELEVATION

DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR ARCHITECT REGISTERED IN THE PROVINCE OF ALBERTA.

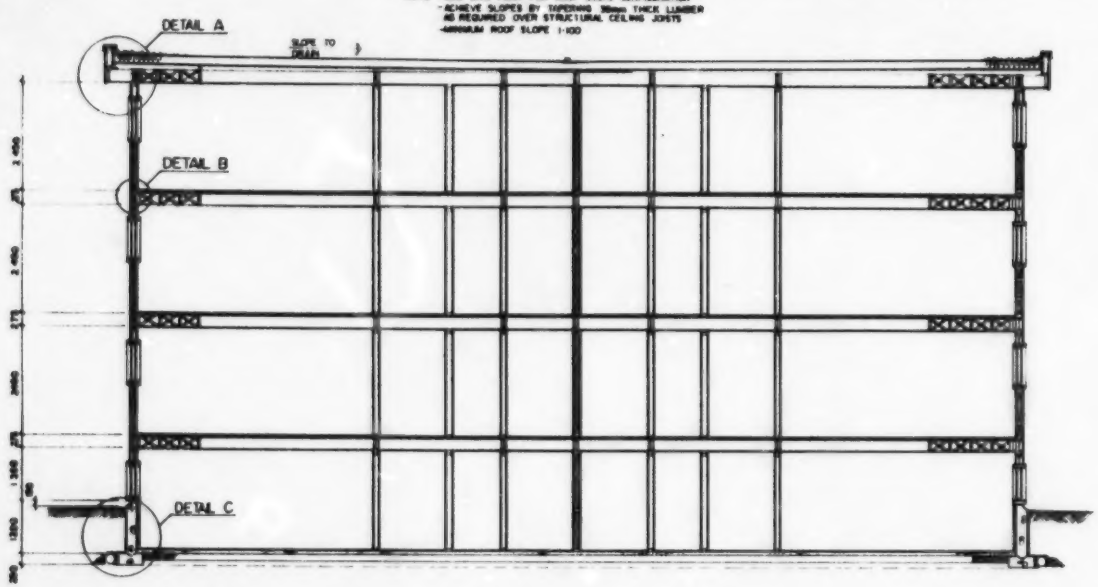
ALBERTA HOUSE COST COMPARISON STUDY

ELEVATIONS

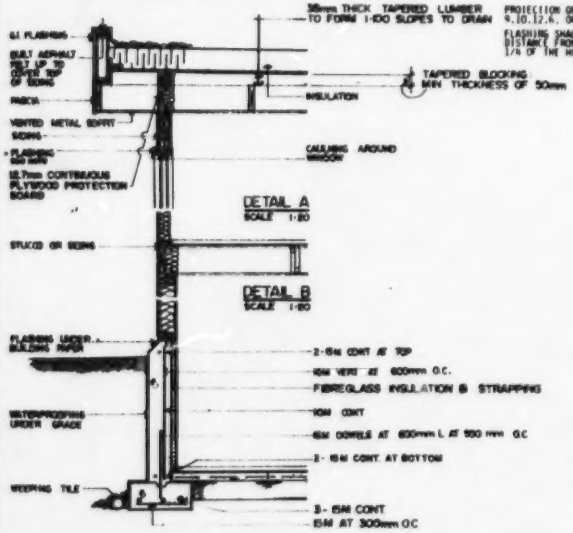
SCALE 1:50

0 .5 1 2 3 4 5 6m

NOTE - SEE SITE PLAN FOR ROOF SLOPE CONFIGURATION
- ACHIEVE SLOPES BY TAPERING 38mm THICK LUMBER AS REQUIRED OVER STRUCTURAL CEILING JOISTS
- MINIMUM ROOF SLOPE 1:100

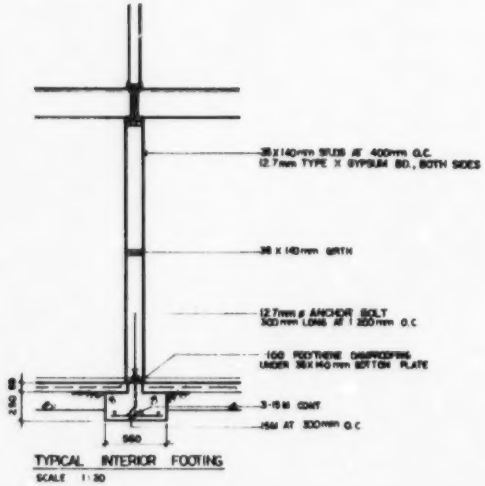


SECTION
SCALE 1:50



PROJECTION OF SOFFITS SHALL BE PROVIDED AS STATED IN ARTICLES 9.10.12.6. OR 9.10.12.7.

FLASHING SHALL BE APPLIED OVER ALL EXTERIOR OPENINGS WHERE THE VERTICAL DISTANCE FROM THE BOTTOM OF THE EAVE TO THE TOP OF THE TRIM IS MORE THAN 1/4 OF THE HORIZONTAL OVERHANG OF THE EAVE.


38x140mm STUD AT 400mm O.C.
12.7mm TYPE X GYPSUM BD., BOTH SIDES
38 X 140mm BRTH
12.7mm ø ANCHOR BOLT 900 mm LONG AT 1 200mm O.C
100 POLYTHENE DAMPPROOFING UNDER 38X140 mm BOTTOM PLATE
3-15M CONT
15M AT 300mm O.C
960

TYPICAL INTERIOR FOOTING
SCALE 1:20

ROOF CONSTRUCTION - 1 HOUR FIRE RESISTANCE RATING

- ROOFING GRAVEL
- BUILT-UP ROOFING
- RSI 6 RIGID FIBREGLASS INSULATION AND VAPOUR BARRIER
- 10mm PLYWOOD SHEATHING - ALL EDGES SUPPORTED WITH MIN. 38 x 184mm WOOD BLOCKING
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 184mm CROSS BRIDGING.

- 15.9mm TYPE X GYPSUM BOARD

NOTE
ALTERNATE INSULATION RSI 5.3 FIBREGLASS BATT INSULATION SET IN JOIST SPACE

EXTERIOR WALL CONSTRUCTION

TYPE A - NO FIRE RESISTANCE RATING

- SIDING OR STUCCO
- BUILDING PAPER
- RSI 2.1 MINERAL WOOL INSULATION AND VAPOUR BARRIER
- 38 x 89mm WOOD STUDS @ 400mm O.C. (38 x 140mm WOOD STUDS @ 400mm O.C. FOR BASEMENT)
- 12.7mm GYPSUM BOARD

TYPE B - 1 HOUR FIRE RESISTANCE RATING.

- SAME AS TYPE A EXCEPT MINERAL WOOL INSULATION TO HAVE DENSITY OF 1.2kG/m³; 15.9mm TYPE X GYPSUM BOARD AND STUCCO OR NON-COMBUSTIBLE SIDING.

FLOOR CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- FLOOR FINISH
- 8mm PLYWOOD UNDERLAY
- 19mm 1 & G LUMBER OR 15.9mm PLYWOOD OR WAFERBOARD SUBFLOOR WITH MINERAL FIBRE BETWEEN JOISTS SPACED 400mm O.C.
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 38mm CROSS BRIDGING AT 2.1m O.C. MAX.
- RESILIENT CHANNELS
- 15.9mm TYPE X GYPSUM BOARD TYPICALLY EXCEPT FOR MECHANICAL ROOM CEILING - APPLY 2 LAYERS OF 15.9mm TYPE X GYPSUM BOARD

CORRIDOR AND DEMISING WALL CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- TWO ROWS 38 x 89mm STUDS, EACH SET 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kG/m² IN EACH SIDE
- 12.7mm GYPSUM BOARD, BOTH SIDES.

BEARING WALL CONSTRUCTION

- 3/4 HOUR FIRE RESISTANCE RATING
- 38 x 140mm OR 38 x 89mm WOOD STUDS @ 400mm O.C.
- 12.7mm TYPE X GYPSUM WALLBOARD, BOTH SIDES

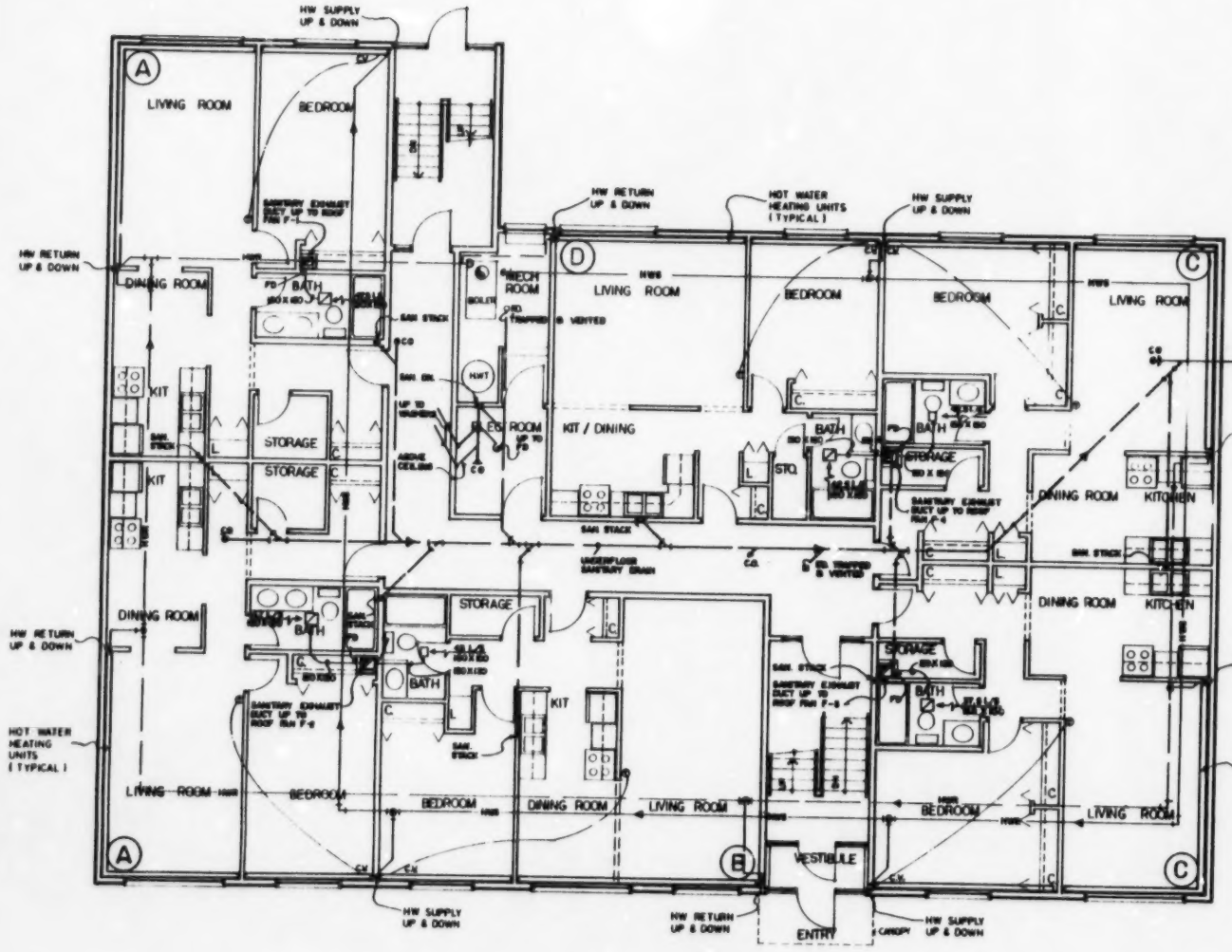
NOTES

*1. PROVIDE GALVANIZED STEEL, GA. #27mm AT THE HEAD OF ALL EXTERIOR OPENINGS.
2. WEEPING TILES SHALL BE LAID ON UNDISTURBED OR WELL-COMPACTED SOIL SO THAT THE TOP OF THE WEEPING TILE IS BELOW THE UNDERSIDE OF THE FLOOR SLAB.
3. ROOF TRUSSES SHALL BE DESIGNED IN CONFORMANCE WITH PART 4 AND FOR THE APPROPRIATE GROUND SNOW LOADS STATED IN TABLE 2.2.1.B. (STANDATA 85-01-030)

ALBERTA HOUSE COST COMPARISON STUDY

SECTION & DETAILS

SCALES : AS SHOWN



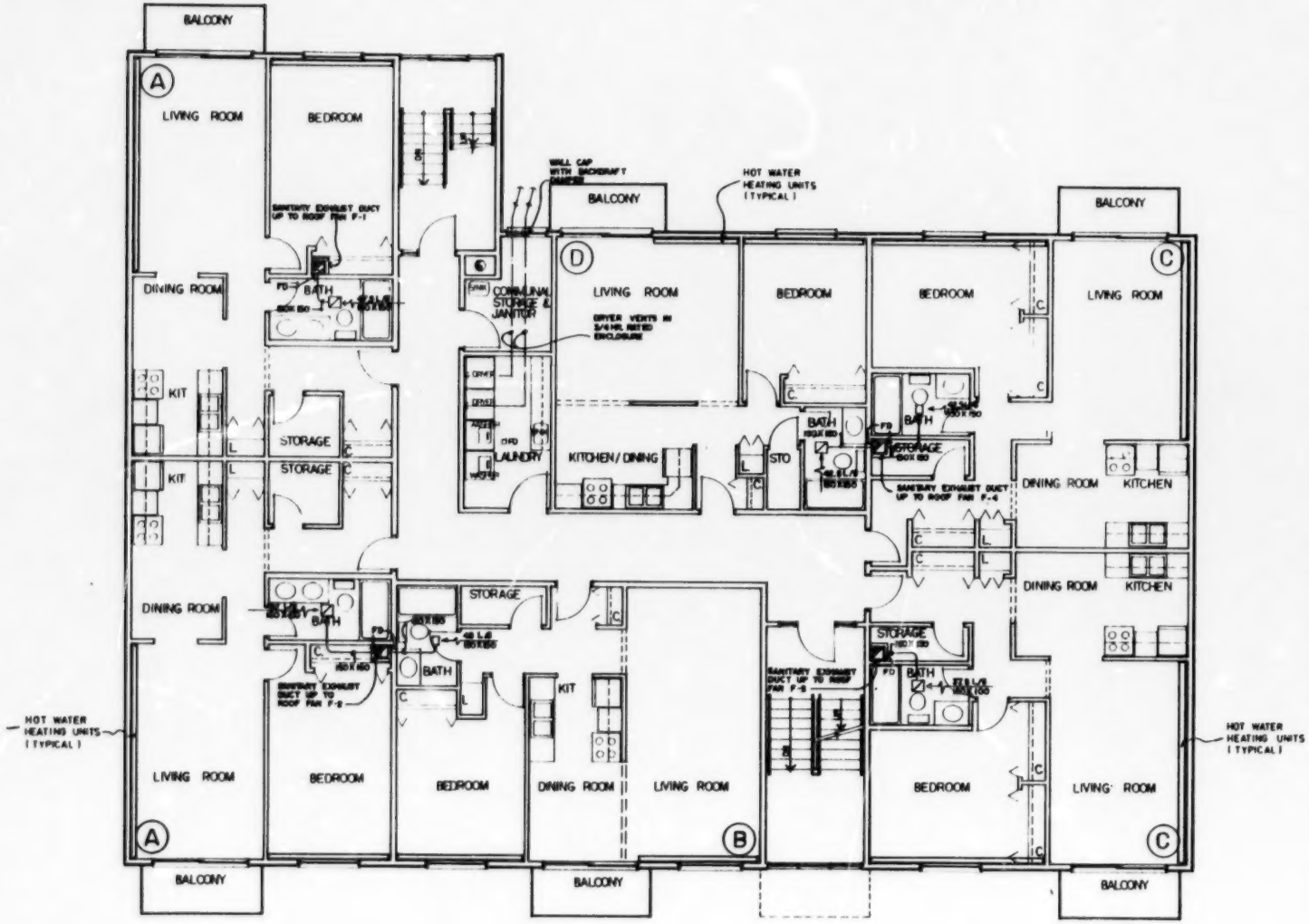
MECHANICAL NOTES

1. GAS FIRED HOT WATER HEATING BOILER SHALL BE INSTALLED IN ACCORDANCE WITH "THE GAS PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THE ACT".
2. PROVIDE TYPE "B" CHIMNEY FOR BOILER.
3. PROVIDE ADEQUATE COMBUSTION AND VENTILATION AIR TO MECHANICAL ROOM.
4. ALL HEATING EQUIPMENT SHALL BE SIZED ON A CALCULATED HEAT LOSS FROM THE DWELLING UNIT SO AS TO MAINTAIN A TEMPERATURE OF 22°C INSIDE AT MAIN FLOOR WHEN OUTSIDE TEMPERATURE IS -36°C.
5. ALL HEATING AND PLUMBING PIPING SHALL BE NON-COMBUSTIBLE.
6. INSULATE ALL SANITARY EXHAUST DUCTS FROM UNDERSIDE OF ROOF TO 3RD FLOOR (2450mm).
7. PROVIDE A MINIMUM OF ONE WALL MOUNTED THERMOSTAT FOR EACH SUITE.
8. PROVIDE FIRE FLAPS ON EACH 150 x 150mm WASHROOM EXHAUST AIR GRILLE.
9. HEATING, VENTILATING AND AIR-CONDITIONING EQUIPMENT SHALL CONFORM TO THE APPROPRIATE REQUIREMENTS OF THE GAS PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THAT ACT.
10. AIR FROM ONE SUITE SHALL NOT BE CIRCULATED TO ANY OTHER SUITE NOR TO A PUBLIC CORRIDOR.
11. AIR CONTAMINANTS RELEASED WITHIN BUILDINGS SHALL BE REMOVED INDOOR AS POSSIBLE AT THEIR POINTS OF ORIGIN AND SHALL NOT BE PERMITTED TO ACCUMULATE IN UNSAFE CONCENTRATIONS.
12. SELF CONTAINED MECHANICAL VENTILATION SYSTEMS, [illegible] KITCHEN AND BATHROOM EXHAUST FANS, [illegible] DWELLING UNIT SHALL CONFORM [illegible] REQUIREMENTS OF SECTION 9.33.

C.V. CONTROL VALVE
F.D. FIRE DAMPER

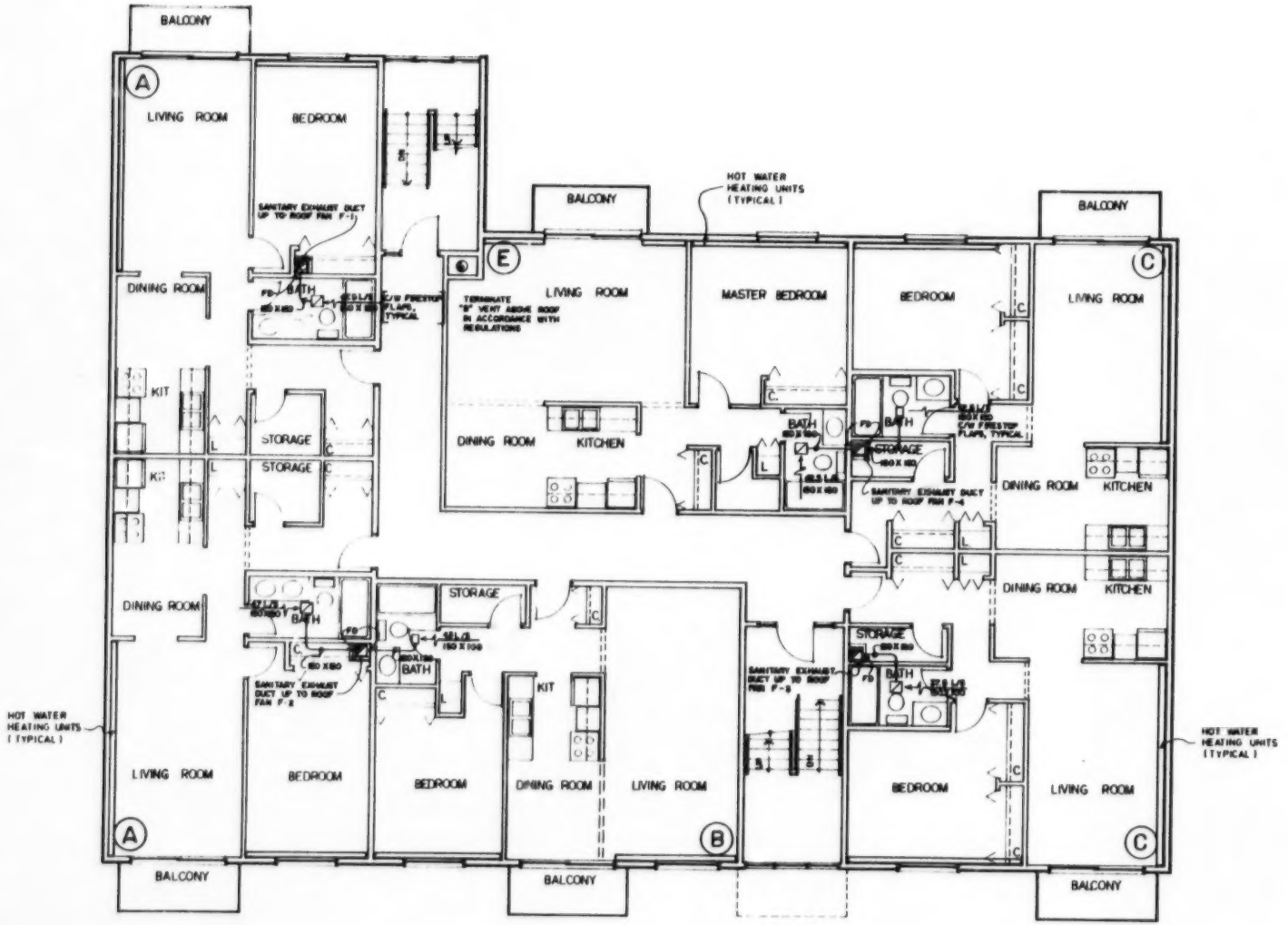
ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1:50



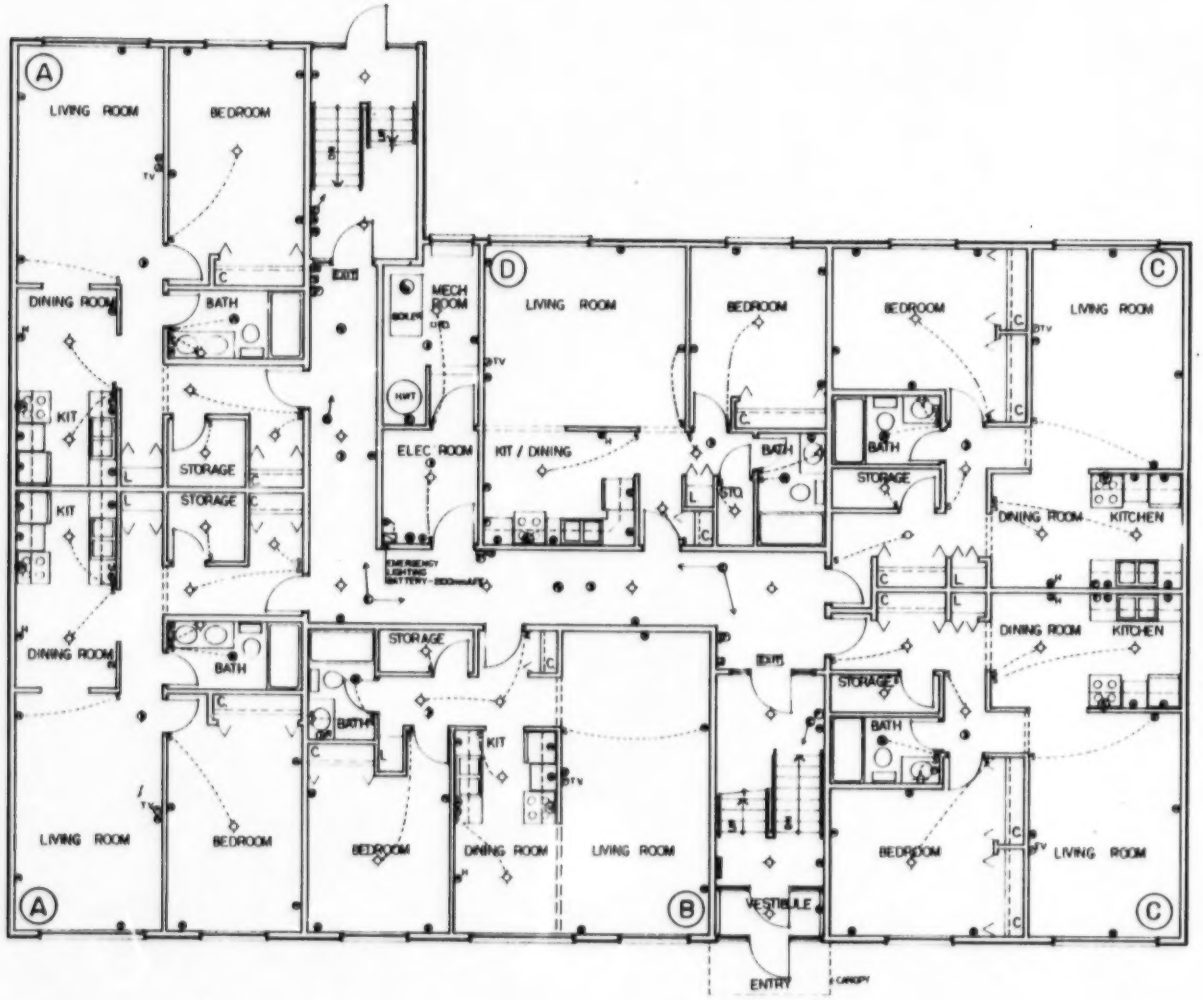
ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1:50



ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1:50



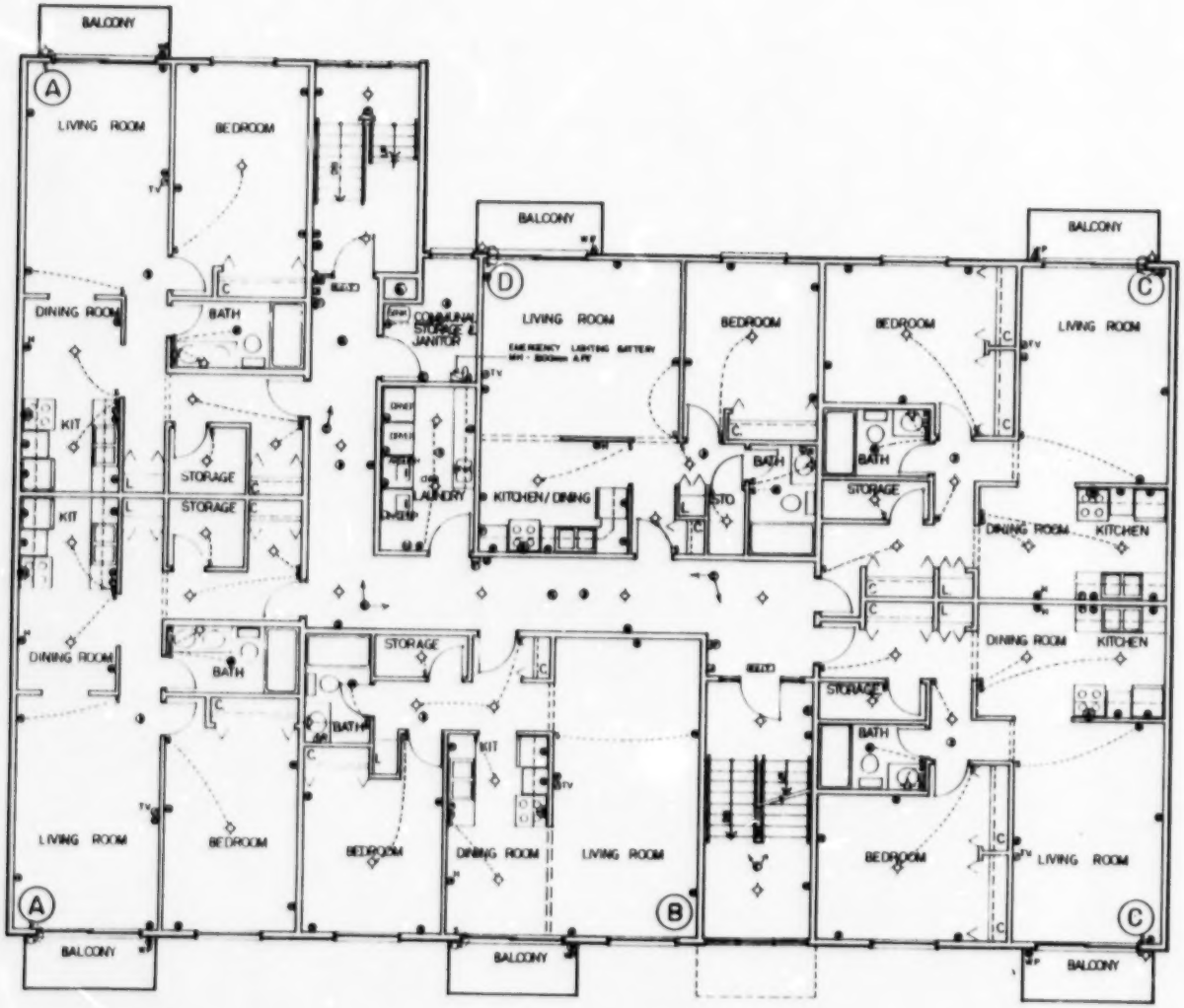
ELECTRICAL LEGEND

- EXIT LIGHTS WITH 2-25W - 120V AND 1-12V-15W EMERGENCY POWER SUPPLY
- EMERGENCY LIGHTING HEAD, 12V-12W
- EMERGENCY LIGHTING, 2 HEADS, 12V-12W
- SMOKE ALARM
- MANUAL FIRE ALARM STATION
- FIRE ALARM BELL, 254mm DIA-METER
- END-OF-LINE RESISTOR
- MASTER FIRE ALARM PANEL C/W ANNUNCIATOR AND GEL CELL BATTERY AND 120V POWER SUPPLY AND AUTOMATIC CHARGER. 1 ZONE PER FLOOR, 2 ZONES - STAIRS

ALBERTA HOUSE COST COMPARISON STUDY

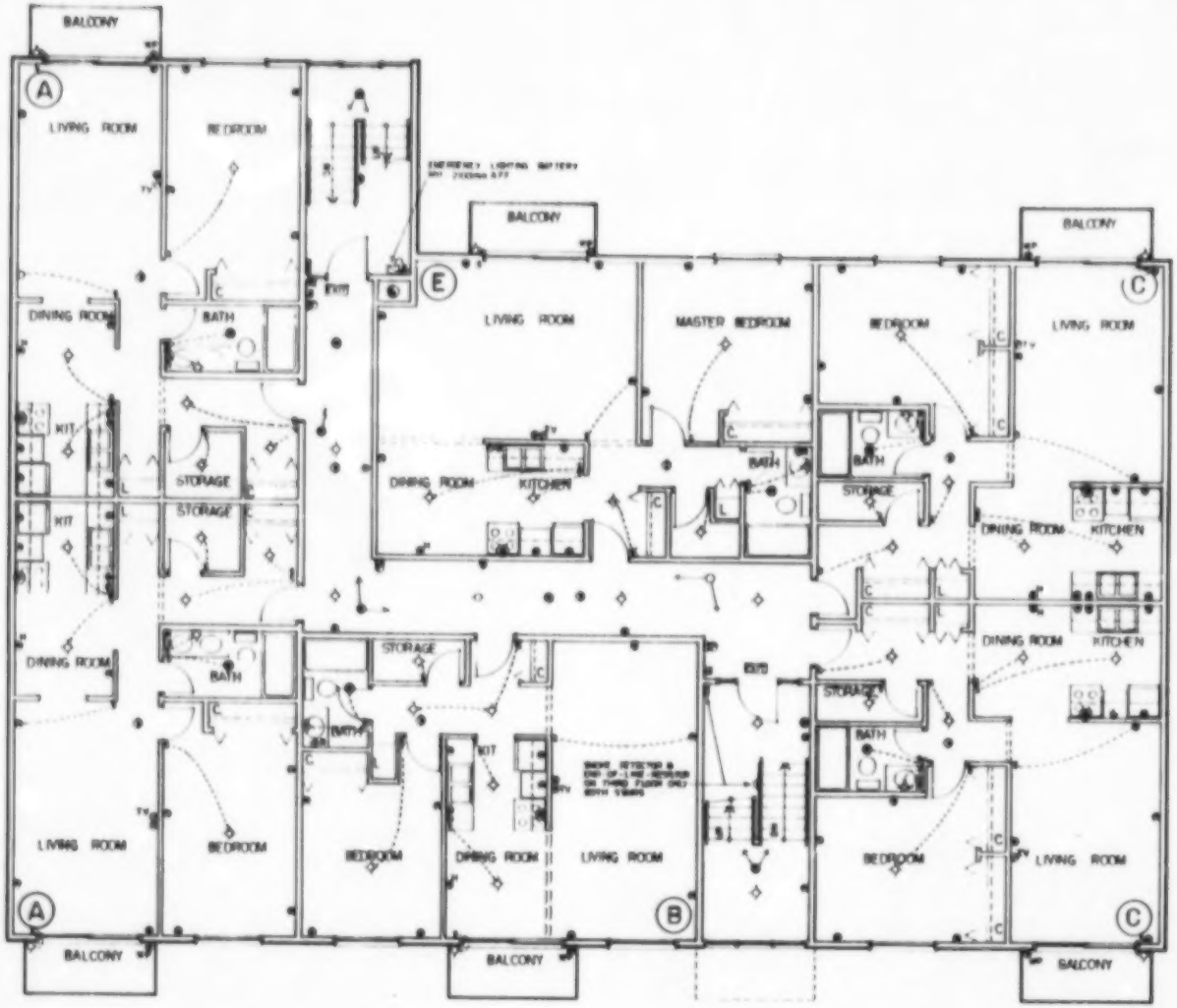
BASEMENT FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1:50

0 .5 1 2 3 4 5 6M



ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1:50



ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1:50